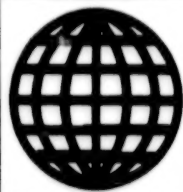


JPRS-UST-92-002
2 MARCH 1992



**FOREIGN
BROADCAST
INFORMATION
SERVICE**

JPRS Report

Science & Technology

***Central Eurasia:
Science & Technology Policy***

Science & Technology

Central Eurasia: Science & Technology Policy

JPRS-UST-92-002

CONTENTS

2 March 1992

Organization, Planning, Coordination

Osipov on Merger of Russian, USSR Academy of Sciences [Yu. S. Osipov Interview; <i>IZVESTIYA (Union edition)</i> , 23 Nov 91]	1
Marchuk Maintains Support of Union Science Establishment [M. Lapina; <i>RADIKAL</i> , No 43, 6 Nov 91]	3
Working Groups Prepare Reorganization of Academy Science [V. Pokrovskiy; <i>RADIKAL</i> , No 43, 6 Nov 91]	4
Confused Leadership Debates Future of Russian Academies of Sciences	7
Shorin on RSFSR Supreme Soviet Plan [V. Shorin Interview; <i>RADIKAL</i> , No 39, 9 Oct 91]	7
Shorin Plan Criticized [S. Dembovskiy; <i>RADIKAL</i> , No 39, 9 Oct 91]	8
Lack of Decision Noted [V. Pokrovskiy; <i>RADIKAL</i> , No 37, 25 Sep 91 p 3]	10
Lack of Leadership Noted [V. Pokrovskiy; <i>RADIKAL</i> , No 39, 9 Oct 91]	12
Burbulis, Velikhov 'Secret' Agreements Rumored [V. Pokrovskiy; <i>RADIKAL</i> , No 40, 16 Oct 91]	14

Budget, Finance

Basic Science Financial Needs Outlined [M. Lapina; <i>RADIKAL</i> , No 44, 13 Nov 91]	16
American Financial Support Saves X-Ray Optics Institute [M. A. Kumakhov Interview; <i>RADIKAL</i> , No 42, 24-30 Oct 91]	16

Facilities, Manpower

New Organizations Replace Ministry of Radio Industry [MOSKOVSKIYE NOVOSTI, 29 Dec 91]	19
Reorganization Plan for Academy Institutes Proposed [S. Ioffe; <i>RADIKAL</i> , No 47, 4 Dec 91]	19
Beneficial Aspects of 'Brain Drain' Noted [Yu. Kabanov; <i>NEZAVISIMAYA GAZETA</i> , 26 Nov 91]	22
'RADIKAL' Reports Recent Organizational Developments in Science [<i>RADIKAL</i> , No 42, 24-30 Oct 91]	22
Polls Reveal Employment Concerns of Scientific Workers [V. Sazanov, N. Popov, et al.; <i>RADIKAL</i> , No 39, 9 Oct 91, No 40, 16 Oct 91, No 41, 17-23 Oct 91]	24

Automation, Information Policy

Computer Enterprises Struggle With Collapse of Computerization Program [L. Zavariskiy; <i>RADIKAL</i> , No 44, 13 Nov 91]	33
--	----

Technology Transfer

New International Moscow Exchange To Sell Intellectual Property [S. Leskov; <i>IZVESTIYA (Union edition)</i> , 28 Dec 91]	35
Effect of Foreign Trade Laws on S&T Research [MOSCOW NEWS, 8-15 Dec 91]	35
French Delegations Negotiated Hi-Tech Projects [RADIKAL, No 45, 20 Nov 91]	36
Cocom Interference in Trans-Russian Digital Optical Link Criticized [N. Suglobov; <i>DELOVOY MIR</i> , 29 Oct 91]	36

Regional Issues

Formation of Ukrainian Academy of Technological Sciences Discussed [V. S. Krivulko Interview; <i>RABOCHAYA GAZETA</i> , 23 Oct 91]	38
Independence Creates Money Problems for Baltic Research Institutes [P. Deynichenko; <i>RADIKAL</i> , No 39, 9 Oct 91]	39
Estonian AS Official on Reorganization, Transition to Independence [M. A. Veyderma Interview; <i>ESTONIYA</i> , 24 Sep 91]	42

Miscellaneous

Russia Seen as Lacking 'Infrastructure for New Technology'	
[P. Deynichenko; <i>RADIKAL</i> , No 47, 4 Dec 91]	45
Scientists Losing Access to Western Technical Literature	
[P. Deynichenko; <i>RADIKAL</i> , No 44, 13 Nov 91]	47
Sagdeyev Interviewed on Crisis of Nation, Science Establishment	
[R. Z. Sagdeyev Interview; <i>POISK</i> , No 38, 13-19 Sep 91]	49
Changes at Various Academies Summarized	53
USSR Academy of Sciences [<i>RADIKAL</i> , No 37, 25 Sep 91]	53
RSFSR Academy of Technical Sciences [<i>RADIKAL</i> , No 37, 25 Sep 91]	53
Ukrainian Academy of Technical Sciences [<i>RADIKAL</i> , No 37, 25 Sep 91]	53
Academy of Cosmonautics [<i>RADIKAL</i> , No 37, 25 Sep 91]	53
Siberian Department of USSR AS [<i>RADIKAL</i> , No 41, 17-23 Oct 91]	54
Crisis in Publication of Scientific Materials Noted [S. Bessonov; <i>KHIMIYA I ZHIZN</i> , No 6, Jun 91]	54

Osipov on Merger of Russian, USSR Academy of Sciences

927A0064A Moscow IZVESTIYA (Union edition)
in Russian 23 Nov 91 p 9

[Interview with Academician Yuriy Sergeyevich Osipov, organizing president of the Russian Academy of Sciences, by Kim Smirnov; date and place not given: "The Russian Academy of Sciences in Place of the USSR Academy of Sciences. What Next? An Interview With Academician Yu.S. Osipov, Organizing President of the Russian Academy of Sciences"]

[Text] [Smirnov] Yuriy Sergeyevich, in connection with the drastic changes in the life of the country and the Federation and with the return to the USSR Academy of Sciences of the name Russian Academy of Sciences a group of authoritative scientists in a recent letter to IZVESTIYA (No 267) proposed to abandon the election to the new Russian Academy of Sciences. What do you think of this suggestion?

[Osipov] The last presidential Ukase puts an end to this drawn out debate. The election will take place on time, from 3 to 7 December. During the 10-day period before the New Year, apparently, the general, joint meeting of the USSR Academy of Sciences and the new members of the Russian Academy of Sciences, which will elect the governing bodies of the unified Russian Academy, will examine the draft of its charter, which has been proposed by the conciliatory commission. The commission consists of two parts: One was specified by the last general meeting of the USSR Academy of Sciences, the other was approved by the parliamentary Committee of Russia for Science and Public Education.

The integration of the union Academy of Sciences and the Russian Academy of Sciences at the forthcoming general meeting is not simply a mechanical combination. It cannot take place according to the old administrative command scenarios and presumes precisely the democratic transformation of academic structures themselves. This is one of the main demands being advanced by the scientific community.

On the territory of Russia all the regional departments, centers, and institutes of the union Academy of Sciences and its members are being transferred to the Russian Academy of Sciences. The USSR Academy of Sciences also remains. But without institutes, as a kind of community of the most prominent scientists for the former Union.

With regard to the letter of the group of academicians and corresponding members of the USSR Academy of Sciences, which was published in your newspaper, I will venture merely to note that each member of the scientific community, of course, has the right to his own interpretation of the events that are taking place.

[Smirnov] In spite of the fact that both in the Ukase of the USSR President on the Status of the Union Academy

of Sciences and in the decision of the Russian leadership about the establishment of the Russian Academy of Sciences there was much from the confrontation at that time of Russia and the center, the essence of the Ukase was very farsighted. Not only was the independence of science from the state declared, but favorable conditions for its participation in the new economic relations were also provided. Was a step backward from this freedom not taken with the transfer of the academy to the jurisdiction of Russia?

[Osipov] I believe that the independence of science is the main principle, without which its normal, deep breathing is impossible. The laws of the internal life of the academy on no account should be transformed under the influence of political changes, vacillations, and slogans and under pressure from state structures. And in this matter we have complete mutual understanding with the new Russian leadership.

[Smirnov] But our present leaders were raised under the conditions, when the academy obediently fulfilled any assignment of the political authorities. Will there not appear for them the temptation (given all the hymns of praise to freedom) to take a commanding tone with respect to science?

[Osipov] This question also worries me very much. But from all the conversations, which my colleagues and I had with Boris Nikolayevich Yeltsin, I drew a completely clear conclusion: He is well aware that the duty of the state is to provide basic science with material support. But how it will develop and organize itself is the inviolable sovereign right of scientists themselves and the academy.

Of course, the Russian Academy of Sciences should not turn its back on the priority needs of Russia. These are economic, social, and political forecasts, the examination and evaluation of new projects that concern the most different aspects of the life of the Federation. But the main thing still is the development of basic, leading research. And here for the scientists, who are conducting it, there are neither order givers nor advisers.

It is pointless to return to the practice, when political leaders dictated to world-famous scientists how to develop science and in general to any specialists what the homeland needs from them. Such a practice led both the homeland and science to too serious deadlocks.

There is no need to fear that scientists "will get out of hand" and will cease to feel like citizens of their country. All the same service to public interests and the good of Russia was a tradition of our academy from the times of Petr I and Yekaterina Dashkova.

[Smirnov] The peculiar "aristocracy" of science has its own reasons. Democracy in it cannot be unlimited, otherwise we will soon begin to elect academicians on folk curule chairs [kurultay]. But still one of the undemocratic charter principles of the USSR Academy of

Sciences is the division into academicians and corresponding members. Many scientists believe that (we have many such letters). And they suggest: Why not restore justice and leave just the title of academician?

[Osipov] Strategically, I think, it should be that way. The fact that, for example, corresponding members lack the right to vote at the general meeting of the USSR Academy of Sciences seems incomprehensible. But doctors of sciences should also have the right to vote when examining the conceptual aspects of the activity of the academy. For the corps of doctors is one the main components of the academy, which united all its members—academicians, corresponding members, and scientific associates of institutes, laboratories, and other research organizations.

My opinion: It would be correct to have one academic title—member of the Russian Academy of Sciences. That is how it was recorded in the original version of the draft of the charter of the Russian Academy of Sciences. But later collective opinion tended toward a two-step ladder at the academy.

[Smirnov] And what will become of corresponding members of the USSR Academy of Sciences?

[Osipov] In the decision of the general meeting of the union academy it is said that they will become corresponding members of the Russian Academy of Sciences. Incidentally, among the candidates for Russian academicians there are more than 90 corresponding members of the USSR Academy of Sciences.

Perhaps, for the scientists, who achieved a high mark, but did not become academicians, it is worth even holding an additional round of the election of new corresponding members (provided they do not yet have this title).

[Smirnov] But is it perhaps better to transfer all the corresponding members of the USSR Academy of Sciences to the Russian academy?

[Osipov] If the general meeting so wishes, this is a very reasonable solution. But for the present the conciliatory commission is proceeding from realistic compromises of the transition period. All the members of the USSR Academy of Sciences are automatically becoming academicians and corresponding members of the Russian Academy of Sciences.

[Smirnov] And those, who live in other republics, and now in foreign states?

[Osipov] Everyone.

[Smirnov] But what if some union academicians, let us suppose, from Lithuania or from Georgia, do not want to become members of the Russian Academy of Sciences?

[Osipov] As the free person wishes. Any scientist has the right not to become a member of the Russian Academy of Sciences or to leave it. But I want to believe that

scientists will be above political vanities, for science is unified. On its borders there are no border posts—only discoveries which are intended for all the people of earth.

[Smirnov] At the general meeting of the USSR Academy of Sciences you named the "three whales," on which the Russian Academy of Sciences should be based: the necessity for Russia of its own academy, the intolerance of its opposition to the union Academy of Sciences, and the integration of basic science and education. What priority steps can be taken in these directions?

[Osipov] The first two questions have been settled by life. The unity of science and education is a very painful ganglion of the new academy. How is one to carry out their integration under the conditions, when in society the interest in knowledge and in science is decreasing catastrophically?

If the state wants to be great, a necessary component is a high level of spirituality and culture, a cult of education, a cult of intelligence, a cult of creativity. If this does not exist, we will live in a third-rate country, in which, perhaps, with time hungry people will disappear, but spiritual freedom will not be firmly established.

And here serious steps on the humanization of our science and culture lie ahead of us. Take a look: In Russia there are no, for example, institute of manuscripts and institutes of world culture and the Russian provinces, there is little serious research on regional studies, the role of which in national self-consciousness is invaluable, but which in our country is in a horrible state.

Incidentally, the scientific community greeted favorably the decision of the presidium of the USSR Academy of Sciences on the establishment of the Center of Humanities Knowledge. But, alas, for a number of reasons it never began to operate. The contempt for humanities knowledge is avenging itself by the loss of interest among young people in general in the sciences, including the natural sciences.

[Smirnov] Is it perhaps a matter of a change of values? Previously disinterested people went into science. But now there is the inflexible orientation of young people toward business.

[Osipov] Perhaps. But they do not understand that real, not cowboy, business is a serious science and deference to it. The profit in the West is formed first of all through scientific and technical progress. But our short-sighted first-generation businessman is naively convinced that he will be able to wring out an incredible profit endlessly through buying and selling.

But all these people were formed by our school, our society, the lack of spirituality of recent decades, hypocrisy, and the dichotomy between the preached ideas and real practical life experience. There was much talk about the unified system of training and education—from kindergarten to graduate studies. But in reality a system

had not been established. The integration of basic science and the higher school reduced to the commendable, but still isolated experience of the best scientific schools. And now the hour of real integration is striking. And precisely the Russian Academy of Sciences, so it seems to me, is called upon to take this mission upon itself.

It is necessary to establish unified scientific educational centers, at which the best universities and technical higher educational institutions, as well as secondary schools would become a part of academic laboratories. Call the latter [secondary schools] what you wish—lyceums, gymnasiums, or as in the old times namely schools. The crux of the matter is that they would be incorporated in a unified system of education and science.

Let them become a system of communicating vessels. Let this be many, many triple chains. It is necessary to emancipate in this respect the academy, the higher educational institution, and the school. Suppose that one of the prominent universities of the country becomes the base university for the Russian Academy of Sciences. A small presidential council, three or four of the most prominent scientists headed by the president of the university, manages its affairs. The rector remains. But this is an executive who is subordinate to the council.

[Smirnov] But what university? Moscow University?

[Osipov] Any one. But a first-class one.

[Smirnov] In connection with your ideas of the integration of science and education what do you think of their separation in one of the latest ukases of the RSFSR President? I have in mind the establishment of two separate Russian ministries—of science and of education.

[Osipov] I believe that it is necessary to make a serious amendment to this decision: Science and education should be bound together and be coordinated by a single ministry.

Marchuk Maintains Support of Union Science Establishment

927A0062A Moscow *RADIKAL* in Russian
No 43, 6 Nov 91 p 1

[Article by Marina Lapina: "G. Marchuk Promises Much Money. Perhaps, Even in Currency"]

[Text] After the holding in October of the last General Meeting of the USSR Academy of Sciences in the highest echelons of the management of science a period of trouble began. Its former leaders depending on their own vision of the situation and personal pretensions, it appears, were divided into two teams. The first, of which several active members of the former presidium are members, are continuing to play the Russian card, hoping in case of winning to obtain several command posts in the leadership of the Russian Academy of Sciences. I do not think that in this game their chances of

winning are too great, but the wagers have been made, and it is necessary to continue the struggle.

The second academy team headed by G. Marchuk is still directing attention to the same Academy of Sciences, rather, to its revival under a different name and in a different capacity. As far as the name goes, Guriy Ivanovich took a fancy, in my opinion, to the most inappropriate one: the National (in the absence of a unified state!) Academy of Sciences. It has been heard several times from his lips namely in such a wording. However, it will be necessary, of course, to think some more about the name—no one is arguing about this.

The very idea of revival, which was also discussed at a conference under the chairmanship of G. Marchuk immediately after the completion of the work of the General Meeting, is far more important. In addition to Guriy Ivanovich, for whom the prospect of holding one of the key positions in the Russian Academy of Sciences obviously does not shine, of the members of the highest command personnel Academicians N. Laverov and V. Kudryavtsev, as well as representatives of many republic academies attended the meeting. They more than anyone are interested in the implementation of the idea of establishing some interstate coordinating scientific council, which is capable of giving effective support to individual scientific directions or schools in the former union republics. The envoys of the small academies do not conceal the fact that their situation, which is difficult as it is, was aggravated after the decision on the transfer of the USSR Academy of Sciences to the jurisdiction of Russia was made.

These apprehensions are not unfounded. In their own republics they cannot count on effective assistance to science, while Russia, to all appearances, intends to deal exclusively with Russian projects and programs. It remains to hope for a new interstate structure, the activity of which, as its organizers plan, will by no means be confined only to teas.

To all appearances, Marchuk and his allies expect to reserve for themselves the questions of the coordination of the activity of interrepublic and large republic centers of science and the examination of individual projects and programs. It is clear that money is necessary for this. And here we are approaching the primary thing. G. MARCHUK. JUDGING FROM HIS OWN STATEMENT, WHICH WAS MADE AT THE SAME CONFERENCE, HAS SUCCEEDED IN GETTING IT.

True, Guriy Ivanovich did not explain of what amounts it is a matter and from where they came, but, strictly speaking, no one demanded these explanations. The questions, in my opinion, are of fundamental importance. If the new interstate structure, no matter what you call it, has considerable assets, in science a time of diarchy may begin, inasmuch as Russia, undoubtedly, will prefer to reserve the control functions for itself.

But it may actually be a matter, judging from unverified data from informed sources, who are close to the leadership of the former academy, of rather significant sums, moreover, in currency. Influential western partners are prepared to make money available.

As soon as Marchuk himself stated that he had obtained assets, I decided to check out this intriguing report and to obtain at least some information firsthand, that is, from Guriy Ivanovich himself. Contrary to my expectations, this attempt was crowned with total failure. Moreover, the information I have has acquired an even more intriguing nuance.

Alas, they confined the correspondent, following the classic tradition for the leadership of the academy, to contact with two secretaries of Marchuk. After I had stated the essence of the matter to the first secretary, she, having promised to clarify everything, left and after a few minutes invited me—but of course!—to call back the next morning, when the second secretary would be working....

The results of the morning attempt to get in touch with Guriy Ivanovich were entirely unexpected. I again stated the essence of the matter, having impulsively called the conference a meeting of the presidium, and stayed glued to the telephone after the promise "to clarify everything." After a few moments I began to hear again on the receiver the extremely polite voice of the secretary, who "clarified" that there had been no meeting of the presidium at all. In short, the bureaucratic tricks continued.

I once again explained patiently the essence of the matter and once again satisfied myself that the woman I was talking with was simply being cunning (as you understand, not without Marchuk's approval). Her subsequent explanation left no doubt about this. She no longer denied the very fact of the conference, but here eagerly assured me: Everything that is being done now at the academy is being done to execute the decisions of the General Meeting, and invited me to apply to the conciliation commission of the USSR Academy of Sciences and the Russian Academy of Sciences, obviously knowing that it does not deal with the questions that interest me. Guriy Ivanovich, she said, cannot add anything more.

Such a statement of the question seemed more than strange to me. If the obvious fact of the holding of the conference itself was denied, what can one say about the money, which appeared no one knows how and no one knows from where? The incident, it appears, is acquiring a detective novel nuance.

Working Groups Prepare Reorganization of Academy Science

927A0063A Moscow RADIKAL in Russian No 43, 6
Nov 91 p 2

[Article by Vladimir Pokrovskiy under the rubric "Reform in Science": "About What Is One To Talk at

the Coming Conference? Scientists Want to Understand How They Are To Live"—first paragraph is RADIKAL introduction]

[Text] The regular meeting of the organizing committee of the conference of scientific associates of institutions of the USSR Academy of Sciences was held on 21 October.

Of the organizational questions, which were settled here, the final establishment of the quota of representation is perhaps most interesting for our readers. The quota "one delegate per 75 scientific associates," which was proposed earlier and had already been announced in the newspaper POISK, was not approved. Mainly because for the meager financial and hotel resources of Moscow today it is not very "bearable." Given such a quota the total number of conference participants would exceed 900. The organizing committee contented itself with the more modest quota of 1:100.

The dates of the conference were also finally set—10-12 December. These days had already been named earlier, but were not included in any official documents, inasmuch as the organizers of the Russian Academy of Sciences, citing a large number of their own measures, which fall to the very same time, asked that the exact days not be named for the present. Then it turned out that 10-12 December in the schedule of the Russian Academy of Sciences is precisely a window, so that now it is safe to invite foreign guests not in "the middle of December," but on the precisely established days.

The plenary meetings of the conference will be held in the auditorium of Moscow State University, the section meetings will be held among the conference halls of institutes of the capital.

However, not organizational questions, but the reports of the working groups, in whose task the preparation of the basic themes for discussion at the conference is included, were the main topic of discussion. There are, as is known, five of these themes: the structure of the academic community, questions of property and financing, the legal support of basic science, the social protection of the scientist, and international cooperation and problems of migration.

As was already said before, the activity of the working groups reduces not only to guaranteeing the conference the necessary legitimacy, but also to the most careful elaboration of the agenda. So that the precious conference hours would not be spent on empty lamentation, as, for example, happened at the first Congress of USSR People's Deputies, the working groups in the shortest time should not only prepare proposals, which have been approved by the organizing committee, on each of the suggested themes, but also report them in advance to the associates of academic institutes, and then take into account the possible remarks.

At the time of the meeting of the organizing committee none of the elaborations of the working groups was ready for general discussion. But very little time remains. Here,

as far as I was able to notice, the basic burden of the preliminary work rested on the shoulders of members of the Club of Voters of the USSR Academy of Sciences: Neither the people's deputies nor especially the members of the presidium of the Academy of Sciences, who were including on the organizing committee, are displaying appreciable activity. Rather, it is the other way round. Thus, Vice President of the USSR Academy of Sciences Oleg Nefedov, having listened to the opening speech of Aleksey Zakharov, chairman of the organizing committee and the representative of the Club of Voters of the USSR Academy of Sciences [CVAS], reacted with unusual irritation. Having called the report (which was a summary analysis of the formed situation and a brief survey of the proposals of the CVAS) "a set of clichés," Oleg Matveyevich became interested in finding out why the discussion was beginning precisely with the CVAS concept. This is one of the points of view, he declared, and if you listen to all of them, there will not be a result soon. In this point Academician Nefedov, perhaps, is not very correct: In any case, a line of people wishing to present their own version of the conceptual report did not form after his remark, and he himself did not publicize his own point of view, but, on the contrary, immediately left the meeting....

In general there were very few members of the presidium of the Academy of Sciences at the meeting of the organizing committee, and all the reports of the working groups were made by representatives of the scientific community, who set forth mainly the point of view of the CVAS.

The most developed and most detailed report of the group, which is dealing with questions of the structure of the academic community, caused the most disputes of all. As was reported to those who had gathered, the group is studying several concepts of how one should manage basic science in Russia. The working group hopes in the immediate future to present two of them to the organizing committee. The first one, which is moderately radical, envisages a bicameral method of management, when the preserved, but drastically democratized structures share power with the chamber that represents the interests of the academy "demos." Such an idea was proposed by the CVAS long ago, and if something in it changed after August, it is perhaps the fact that today the distribution of power between the chambers is seen by it as having changed greatly in favor of the chamber of the "demos."

The basic and more radical concept, which is now attracting the attention of the working group, is the concept of an association of academic institutes, to which full authority will be transferred. The following structure is proposed. Institutes, laboratories, and working groups are united "by interests" (here both the criterion of the common character of research themes and, in individual cases, the territorial criterion—when, for example, it is a matter of a formed scientific center—can be used). These unions form an association of academic scientists, the highest authoritative body of

which is the congress that is convened regularly. There are two more permanent bodies—the coordinating council and the expert council of the association. The latter is a set of expert councils which are formed by fields of scientific knowledge and by arising problems.

In such a system, in the opinion of the working group, it is necessary to maintain a balance between the administrative and democratic forms of power. The decisions here will be made not by voting, but in a slightly more complicated way—with allowance made for their examination. One of the meeting participants called this procedure fanciful coordination [khitrosogolosovaniye]. This, of course, makes very great demands on experts. So that the authority of experts would not be reduced in the end to the authority of bureaucrats, it is proposed to make the positions of members of the coordinating council and the expert councils elected (or, if I understood correctly, still delegated somehow from below) and frequently changed. Thus, it is proposed to limit to two years the tenure of a person on the coordinating council.

Such is the general, far from complete system. Its basic idea, as in the case of bicameral management, is to create feedback, which is nonexistent today, from the bottom up—from scientific associates to the highest scientific management structures.

Given such a structure the academy as such is deprived of power—and the leadership of the Academy of Sciences could not have liked this. In particular, Yevgeniy Velikhov, the second (or first) cochairman of the organizing committee, assumed the role of a rather inflexible opponent. He bombarded the speaker with questions, the general sense of which reduced to whether the respected colleagues from the "demos" were not acting too rashly. Why, for example, destroy the departments of the Academy of Sciences in order later to establish ones similar to them, but with different people and under different names? One of the conclusions of the CVAS: "We intend to raise the status of academicians, having rid them of routine administrative duties," did not, it appears, evoke particular enthusiasm among the members of the presidium.

Perhaps, it is a good thing that on the organizing committee there is a healthy and, beyond any doubt, reasonable conservative party, which wants to preserve academy structures, however faulty they are, on the plea that any innovation has its advantages and drawbacks, moreover, the latter, as a rule, are not thoroughly analyzed by the authors of the innovations. If the matter is confined to polemics based on the principles of scientific debate (and most likely it will be that way), it is possible to expect that the organizing committee will offer the conference a reliable and well thought out version of the future structures of basic science.

The report of the second group, which is studying the problems of academic property and the principles of the financing of basic research, did not result in serious protests.

With regard to property, the position of the working group is as follows: One must not rush to extremes. It is not necessary that everything belong to the academy, as was envisaged by Gorbachev's ukase on the status of the USSR Academy of Sciences, but the opposite thesis "all property to the institutes!" is also unsound. There is property, which as national wealth should belong to the state, there is property, which as a "national tool" should belong to the community of scientists; the land, on which the institute is located, should, for example, belong to the institute, while a microscope in principle can be the property of a laboratory.

In the opinion of the working group, it is necessary as quickly as possible to get an understanding of the hierarchy of property, inasmuch as confusion in this matter can lead to unpleasant consequences. Thus, the ships, which associates of the Institute of Oceanology use, should not be the property of the institute. Otherwise they will be an unbearable load on its balance sheet, and, on the other hand, the temptation to use them not for the proper purpose, but for the derivation of a profit will appear for scientists.

The problems connected with the financing of science are still only being elaborated, the organizing committee was familiar only with the basic principles. The first and most important task, in the opinion of the working group, is the separation of state assets, which are being allocated for science in general, from the assets that are being allocated for basic research. Such a division is necessary, for otherwise there will always be the temptation to channel assets from basic research into the directions that promise today or in the immediate future the greatest revenues.

The next principle is the principle of the multiplicity of funds. Apparently, it would make sense to take into account the historically established division and to divide funds into academic, VUZ, and applied funds.

The necessity of the separation of base financing from competitive financing was also indicated. Today, when at many institutes there is enough money only to pay wages to associates and to pay for half of the amortization of capital, the primary thing is to ensure base financing. Practically all the money, to all appearances, will be spent on this.

The emphasis on base financing is also necessary because given the emphasis on the competitive distribution of finances, which in itself is both reasonable and progressive, the formed system of distribution and the very composition to the "distributors" do not make it possible to avoid a pronounced protectionist approach, which today can destroy many scientific directions that have an insufficiently "hairy paw." Such a diet is good for a healthy body.

The members of the working group propose today to allocate for base financing on the order of 90 percent of all the money and to give only 10 percent to competitive

financing. Subsequently, as things improve, it will be possible to change this ratio to the opposite—10:90.

Apparently, the opinion of the working group does not coincide with the opinion of the representatives of the Russian authorities, who are in charge of the science budget. If finances will be distributed with an emphasis on competitive financing, the only chance for survival is the complete openness of the information on the division of money.

The third working group—for legal support—submitted to the organizing committee its views concerning what legal documents the scientific community should take as a guide in its activity. In essence, thus far only a list of these documents was read, several of them do not exist even in embryo.

Two types of such documents exist: "external" documents, which specify the legal status of science in general, and "internal" documents, in which the legal units within the community—the statute on the institute, the statute on the department, and the new charter of the academy—are registered. Whereas, the speaker said, with regard to internal documents it is not particularly worth worrying (drafts of them already exist, moreover, at such a stage of readiness that it is possible to bring them to the attention of the conference), the situation with external documents is rather bad. First, the draft of the law on intellectual property, which was submitted at one time by Nikolay Laverov, chairman of the State Committee for Science and Technology, to the USSR Supreme Soviet, was not passed even by this Supreme Soviet. And, of course, it cannot be made the basis for Russian "science" legislation, inasmuch as, the speaker believes, it reflects not the interests of the producer of intellectual property—the scientist, the engineer, the inventor, and so on—but the interests of the institutions that appropriate it. As for the law on science, in a normal society it makes as much sense as a law on young people, on labor veterans, and so forth. However, in our society, which only a madman can call normal, the formed contempt for science, its extremely weak status, the absence of tax credits, and so forth make the drafting of such a law necessary. It is needed as an officially approved obligation of the state to basic science.

I will have to talk a little later, apparently, about the work of the fourth and fifth working groups—the group for the social protection of the scientist and the group that is studying the problems of international cooperation and the migration of scientific personnel. These groups were established quite recently. It is perhaps worth mentioning an amazing fact: At the academy, it turns out, there is no data on the brain drain. No research has been conducted on this problem (an exception is the unfinished and subsequently "terminated" work of Allakhverdyan, about the essence of which RADIKAL recently wrote) and no decisions have been made. It is incomprehensible how it is that the presidium can lay claim if only to some authority, if it is so blind to the sores of its own community.

In conclusion I will emphasize: Everything related here is a raw product that does not aspire at all to the status of proposals of the organizing committee—they themselves will appear when the time is right. We only wanted to remind interested readers that such working groups exist, that they are working, and that they are open structures. They await your help, your suggestions, and your participation during this very important and very short preparatory period.

Confused Leadership Debates Future of Russian Academies of Sciences

Shorin on RSFSR Supreme Soviet Plan

927A0046A Moscow RADIKAL in Russian
No 39, 9 Oct 91 p 3

[Interview with Vladimir Shorin, chairman of the Commission of the RSFSR Supreme Soviet for Science and Public Education, by Sergey Stepanenko; date and place not given: "It Was Proposed to Prohibit the Society of Academicians To Have Scientific Organizations"]

[Text] [Shorin] Under the conditions, when academies in the republic are appearing like mushrooms after rain and each aspires to a truly scientific one, it was difficult to establish the Russian Academy of Sciences (ROSAN). There was enough criticism: from the right, from the left, from above, and from below. In the summer passions began to subside, but the August events pushed time forward. If the comparison is appropriate, I would say that the bear has now woken up, asking: "But how am I?" First of all this pertains to the leadership and the presidium of the USSR Academy of Sciences and their desire no matter what to preserve the old structures of the Academy of Sciences.

What is the Academy of Sciences today? It is not such much a creative scientific center as an administrative organization. A kind of ministry with all the defects that were born under our conditions. Take if only the fact that more than 90 percent of its members live and work in Moscow and the capital oblast.

The concept "academician" was always linked with the concept of a well to do, socially protected person who receives big privileges. There is no arguing, the best minds of science are a priceless treasure of the state. But did the best people receive this title? Many arrows flew at the USSR Academy of Sciences precisely because people got in there not for scientific services, but for ties and for administrative posts. Perhaps, the aspiration of the presidium of the Academy of Sciences, having changed the signboard, to keep the content old is from here. Although, I will not conceal it, at the academy itself there are forces that are speaking in favor of the reformation of the Academy of Sciences and the revision of its former management mechanism.

[Stepanenko] Did events at the Academy of Sciences, apparently, also influence the organizers of the Russian Academy of Sciences?

[Shorin] We are taking a calm position. However strange it would seem, "reformers" from the Academy of Sciences, who all the time are maneuvering and playing political games, helped us in this. This is particularly evident if you look at the minutes of the meetings of the presidium of the USSR Academy of Sciences. The spectrum changes from complete rejection of the Russian academy to a unanimous "for." Recall that a year ago, when the Academy of Sciences by the Ukase of USSR President M. Gorbachev was removed from the union system and acquired independence, the Supreme Soviet of Russia adopted a special decree on the nonrecognition on the territory of the RSFSR of Paragraph 2 of this Ukase. We considered that one must not place in the hand of a public organization such national wealth as the physical assets of the USSR Academy of Sciences are.

The Russian Academy of Sciences is being established on the basis of a law that was passed more than a year ago by the RSFSR Supreme Soviet. Several decrees of the Presidium and the Supreme Soviet of the republic regulate the law. These legislative acts also predetermined the character of the future academy, which differs rather sharply from the USSR Academy of Sciences. First of all the Russian Academy of Sciences is trying to reform and preserve basic science and to stimulate its development throughout Russia. The role of Soviet basic science in the world community is recognized, and in many scientific directions we are in the front ranks. For example, at individual colleges of the United States the teaching of mathematics is conducted in Russia. Parties of people pressed into service from foreign scientific centers actually are purposely coming to us. Therefore, the preservation of scientific research institutes and their potential is the task of tasks of the Russian Academy of Sciences.

Moreover, I would like with the help of the new academy to fill in the gap, which separates science from the higher school, and to get rid of the situation, in case of which both science and higher educational institutions languish.

Finally, at the Russian Academy of Sciences it is necessary to try to sever the "administration-science" tie. Let academicians deal with science and directors with administration. (At one time, when discussing the postulates of the Russian Academy of Sciences, it was proposed to incorporate in them a rigid framework: to prohibit the society of academicians to have scientific organizations. Let its members work at any scientific research institutes—state, cooperative, private—but the community of academicians itself should be a kind of elite club, which gives advice and is concerned about the strategy of scientific research. The Supreme Soviet rejected these proposals.)

Of course, the Russian Academy of Sciences first of all must get to the heart of the problems of Russia and help it. The natural and technical areas of research stand relatively firm, but the problems of the humanities are in

a deplorable state. The questions of the latest processing and preservation of agricultural products require separate attention.

[Stepanenko] Who will be the founders of the new organization?

[Shorin] Scientists with the rank of not less than doctor of sciences from the entire territory of the republic will be the founders of the new Russian academy. It is divided into 11 regions plus Moscow and Moscow Oblast, which act as independent units. Regional committees have been organized, they have held meetings and conferences, at which the founders were also nominated. The statistics are as follows: 70 percent (of the total number) are founders from the provinces, 20 percent has been given to the USSR Academy of Sciences, and 10 percent has been given to the organizing committee. In all 250-300 people are being recruited. They will convene at a congress (essentially this will be a congress of Russian scientists) and will elect the membership of the Russian Academy of Sciences. And let the members of the new Russian Academy of Sciences clarify the relations with the USSR Academy of Sciences. I think that administrative intervention is intolerable here, scientists should come to an agreement themselves.

[Stepanenko] Is the organizing committee taking into account representatives of "departmental" science?

[Shorin] I will cite just a list of the founders of the section of engineering science, of which I am the chairman. There are here representatives of the Moscow Aviation Institute imeni Sergo Ordzhonikidze, the Samara Aviation Institute, the Splay Scientific Production Association, the Karelian Institute of Geology of the USSR Academy of Sciences, the Prikladnaya mekhanika Scientific Production Association, and others. Even from this list it is evident that scientific forces of the higher school, the USSR Academy of Sciences, and industry have been gathered in the section. I am certain that in the other sections the enrollment is similar. I will repeat, the task of the Russian Academy of Sciences is to represent science of the republic to the full extent, and not to engage in the internal reforming of the USSR Academy of Sciences.

I am a realist and understand that we are not giving birth to an ideal child, but I am confident of the main thing: The correct direction in the development of the Russian Academy of Sciences has been chosen, and it will raise the prestige of the scientific community in Russia. It will make it possible to unite the higher school with science and to involve production firms and sectorial scientific research institutes more actively in research activity.

The questions of the interrelations of the Russian Academy of Sciences and the USSR Academy of Sciences are not worth the fuss that has been raised over these organizations. This, it seems to me, is a superficial and extraneous thing. I will repeat, scientists should come to an agreement themselves. Now it is necessary to

worry not about the academies, but about the preservation of our science. To do everything possible (our Committee of the RSFSR Supreme Soviet is engaged namely in this) so that scientific research institutes and scientific collectives would not fall apart. Here it is possible to "chop a lot of firewood" in an hour's time, but one will spend decades putting together a splinter at a time. Now it is necessary to help these collectives, to provide finances, and to give people an opportunity to work quietly.

Russia will take all scientific organizations under its protection unequivocally, no questions and problems should arise here. Strictly speaking, Russia also paid the lion's share of the science budget of the entire country. But now it is necessary to make a complete audit of what programs the money is being spent on: It is necessary to support something, but it is necessary, pardon me, to reject something. I will not conceal it, the task is very serious: One should not destroy good collectives, but at the same time there are enough scientific research institutes, at which they are wasting time in useless debate.

Shorin Plan Criticized

927A0046B Moscow *RADIKAL* in Russian
No 39, 9 Oct 91 p 3

[Article by Prof. Sergey Dembovskiy, full member of the RSFSR Academy of Natural Sciences: "On the Fate of the USSR Academy of Sciences and on Who Is Establishing the Russian Academy of Sciences, How, and Why"]

[Text] Will the USSR Academy of Sciences be reformed? The settlement of this question today depends almost entirely on Russia, on whose territory nearly all the institutes of the USSR Academy of Sciences are located. But Russia for the present does not have its own Academy of Sciences. The Supreme Soviet back in June 1990 adopted a decision on the establishment of the Russian Academy of Sciences (RAN), and this idea was supported by everyone. Let us trace the latest facts.

The presidium of the USSR Academy of Sciences on 17 September adopted a decision on transferring to the jurisdiction of Russia. But Boris Yeltsin for the sixth time did not receive representatives of the Academy of Sciences in the person of the president and vice presidents. There are no available documents of the Supreme Soviet of Russia and its President on the taking of the USSR Academy of Sciences under the jurisdiction of Russia—the USSR Academy of Sciences remains without support. Yeltsin entrusted all matters regarding the Academy of Sciences to the Committee of the Supreme Soviet for Science (the chairman is Deputy Doctor of Technical Sciences V. Shorin, it operates under the supervision of R. Khasbulatov), while it set up the organizing committee of the Russian Academy of Sciences, decided to hold elections, and published in the August issue of POISK the statute on elections. There the promise was given to publish in all but the next issue

the draft of its charter. But this document also did not exist in October, although the energetic organizing committee was conducting the nomination of candidates for academicians and even completed this process by 10 October, promising the election itself in a month or two. A question immediately arises: But how will the election be held and what is the charter of the future Russian Academy of Sciences like?

It is logical to seek the answer to this question in the Statute. Paragraph 11 of the Statute indicates that all Russian doctors of sciences can be electors, but (Paragraph 12) only those who have been appointed ("recommended") by the departments of the USSR Academy of Sciences (20 percent), the 12 regional organizing committees (70 percent), and the central organizing committee (10 percent).

They are not elected, but appointed! Immediately one began to feel the cold draft of stagnation and Stalinism, and associations began to emerge: We know, after all, what takes place in case of the trampling of the freedom of choice, to what the appointment of "one's own" people leads, and who is approved in this case. As a result the scientific community is isolated and alienated. Even the elections to the existing USSR Academy of Sciences were more democratic. Here it is not indicated whether representation depends on the number of doctors or is uniformly distributed among the 12 regions. At the head of the majority of local committees there is not one truly prominent scientist, but officials, including members of the Academy of Sciences (mainly corresponding members), are conspicuous.

The very emphasis on the regional principle of representation raises doubt. The point is that, as someone on our scientific council (of the Institute of General and Inorganic Chemistry) joked, among the regions there are such ones, in which there are no scientists at all, but there will be electors and candidates for academicians. But of course: In our country, after all, the idea of equality in poverty and the lack of rights, which has been exploited for so long by the communists, has become entrenched. But the principle that equality is important, while skill is not—this principle is inapplicable by definition to science.

A reasonable solution of this problem, which is universally accepted in world practice, exists. Yes, the electors should be doctors, but doctors who are elected in the scientific collectives—in proportion to the size of the collective. For the implementation of this procedure even the establishment of local organizing committees is optional.

The nondemocratic method guarantees the election of one's own or essential people (skill in this case does not play any role). Here the most important element of elections—genuine competition—disappears. And the result is easy to predict: Everything will proceed again according to a plan, which was drafted in advanced by a

staff of appointed officials, while the scientific community will be isolated, performing the role of an extra and a cover simultaneously.

The consequences of such a practice are well known. People who are far from real science—directors, generals of the military-industrial complex, and, finally, very shrewd pseudoscientists and falsifiers—will fill positions at the Academy of Sciences.

Let us return to the charter. It is suspicious that thus far it has not been published. A large number of similar situations of the period of perestroika, particularly beginning with the Congress of People's Deputies (May 1989), when a lot of ukases, laws, and so forth were adopted, immediately come to mind. They were put together as follows: First the walls and the roof were built, and then someone at times remembered the foundation. It also happened that no one remembered.

I attempted to clarify two fundamental questions which should find mandatory reflection in the charter. First, will the new academicians have privileges, including a lifetime academic wage that does not depend on the results of their work? I called the organizing committee of the Russian Academy of Sciences and ascertained not without difficulty that they will. Well, that is a good one for you! The scientific community fought against this filth, but ran up against the same thing. It became clear why they did not publish the draft of the charter. And this is when the average academic wage of the majority of scientists (300-400 rubles [R]) is far below the threshold of official poverty and destitution (taking into account mouths) and even an academician who is a director earns less than, say, a trolleybus driver! It is not occurring to the zealots of Russian science that it would be a good idea to address this money (if there is extra) to the scientific associates who have gone hungry on R300-400.

But what about property? To whom will it belong in accordance with the charter of the Russian Academy of Sciences? Just as in the prevailing charter of the USSR Academy of Sciences, to the academicians? The questions remained unanswered.

The establishment of the new Academy of Sciences, which for the present has only the support of the state, is leading to conflict with the old Academy of Sciences, which embodies nearly the entire potential of basic science and a significant portion of applied science of Russia, but does not have the support of the state. The winner, as always, will be the strongest, while the loser will be the weakest—the USSR Academy of Sciences, which will, in essence, be forcibly reshaped into the new system, which, moreover, turns out to be well-acquainted old one.

Why such complicated means, and, besides, with inevitable losses and confrontation, with conflicts, which are aggravated by inevitable unemployment? Why scoff at us so?

I think that a simple and conflict-free means exists for solving the problem. It is beginning to become visible. The first scientific associations, which reflect and defend the interests of scientists—the Club of Voters of the USSR Academy of Sciences, trade unions, and the Union of Scientists—have emerged. New unprivileged democratically elected academies, for example, the RSFSR Academy of Natural Sciences, have appeared in Russia. These new organizations have raised the question of the necessity of reforming the charter of the USSR Academy of Sciences. And its presidium is already prepared to agree to serious negotiations. The USSR Academy of Sciences obtained the chance of self-improvement by evolution in a presidium-scientific associations dialog. True, a chance, and only a chance. This process can frustrate the establishment of the Russian Academy of Sciences with the old defects.

And we will also bear in mind that the Russian Academy of Sciences is to a considerable degree an outlying region, where the process of democratization has been slowed greatly. In this connection the intention of officials from science to prolong feudalism in the provinces is already visible. The destruction of the USSR Academy of Sciences should by their design reduce the pressure of public organizations of scientists.

Here, in my opinion, is what one would have to do to solve the problem of the Russian Academy of Sciences and to decide the fate of the USSR Academy of Sciences.

1. It is necessary to postpone the election to the Russian Academy of Sciences. To publish and discuss extensively its charter. To hold the election, if it will have to be held, in a democratic way—to elect, not appoint, the electors in proportion to the number of Russian doctors.

2. The RSFSR Supreme Soviet and President B. Yeltsin should immediately recognize the Academy of Sciences as the foundation of the Russian Academy of Sciences. This follows from the fact that the scientists of the Academy of Sciences are citizens of the Russia and their institutions and property are the property of Russia. It is necessary to put an end immediately to the disgrace: They treat associates of the Academy of Sciences like citizens of another state that is temporarily on the territory of Russia!

3. The academy should be reformed on a democratic basis—in this, the Supreme Soviet and the President can give invaluable assistance to the institute of Russian science.

Most unfortunately, the deputies of the Supreme Soviet, who are members of the Committee for Science, took a very difficult path, which should reconstruct the new Academy of Sciences with the old defects and at the same time should invariably cause conflict, which will be settled, in essence, by violent means. They showed their intolerance toward public opinion, incompetence, and unusual aggressiveness, for they chose a path that leads to confrontation.

Lack of Decision Noted

927A0046C Moscow *RADIKAL* in Russian
No 37, 25 Sep 91 p 3

[Article by Vladimir Pokrovskiy: "How Is the Scientist To Ruin the Letter of Enfranchisement?"]

[Text] "We are in the position of serfs, whom one feudal lord is trying to buy up from another. We can merely talk about which feudal lord is better and whose quit rent is less, but for the present are unable to actually influence the situation."

One of the speakers at the meeting of the Moscow academic community, which was held on 13 September in the conference hall of the Physics Institute of the USSR Academy of Sciences (associates from 51 academic and seven nonacademic institutes attended), said this. He said it, perhaps, a little too strongly, but to the point. In any case, those who had gathered were very worried about their serf position and devoted almost more time to it than to the question, for the sake of which they had gathered—the organization of a congress of scientists, a congress, at which science itself should decide how it is to survive and how it is to go on living.

Practically no chances remained that the presidium of the Academy of Sciences would give them a letter of enfranchisement. The tough and not too fruitful meeting with Guriy Marchuk, about which we gave an account in the last issue, still left some room for hopes for constructive cooperation in the reforming of the academy, but the meeting of the presidium, which was held on 10 September and to which representatives of the academic "demos"—the Club of Voters of the USSR Academy of Sciences and the Union of Scientists—were invited (the only fruit of the meeting with Marchuk), thoroughly shook these hopes.

As Vladimir Olshanskiy, a member of the Club of Voters of the USSR Academy of Sciences who attended the presidium of the Academy of Sciences, related at the Physics Institute of the USSR Academy of Sciences, the main discussion was over a "paper," which was read at the very beginning by Vice President of the Academy of Sciences Yuriy Osipyan and was prepared by the leadership of the presidium at the request of M.S. Gorbachev for a session of the State Council. At that session, along with other union structures, the fate of the USSR Academy of Sciences ought to have been decided, and, as is now known, the State Council approved the proposals that were set forth in it.

The statement part of the documents, in the words of Olshanskiy, was written in the good, old Soviet publicity style—"about which academy is good, how much has been done there altogether, how many foreign members there are, what an international ring there is, what great difficulties there are now." Further it was asserted that the academy "is, of course, a consolidating force, it was

always strong for its multinationality and extradepartmental nature and, therefore, should remain a union structure."

Then a question was asked: "Why, if the document should be on Gorbachev's desk at 3:00, are they familiarizing us with it only at 2:00?" After a lively discussion on the theme of who is the master in the house, during which the president of the USSR Academy of Sciences took the liberty of expressing offense like "I wanted as well as possible, I wanted to ask for advice, but you go do that! You do not want to—well, it is not necessary," the document was supported by the presidium with three abstentions.

"The presidium, in my opinion," Olshanskiy noted, "is in the same position as we are. It does not decide anything, a few people from the leadership make the decisions. But 'ordinary' academicians hold for the most part the same views as the other scientists."

But the very trouble is not even this. As Mikhail Mazo, cochairman of the Moscow Union of Scientists, said at the meeting at the Physics Institute of the USSR Academy of Sciences, the whole horror is that "no one in the leadership of the presidium is lifting a finger to reform the academy at least somehow reasonably and is thinking about how science is to survive in this situation. Neither the commissions, the planning and finance department, the accounting office, nor the other services of the academy are dealing with these questions."

Thus, Marchuk's "cabinet" continues to lose points rapidly. Not having been able to overcome after the putsch the distrust of the scientific community and having even increased this distrust by its subsequent Olympian calm toward the needs of scientists, it is becoming a structure, without which it is possible, should anything happen, to manage when preparing for the congress of scientists. While if such a congress is held, its decisions will hardly please Guriy Ivanovich and colleagues. Of course, without the presidium it is difficult to convene a representative forum, but then only different structures can help—already now, without relying too much on the academy, the initiators of the congress are actively entering into contacts with the Russian government with the request to support the idea of the congress. It will hardly refuse such a good cause.

However paradoxical, it is not worth rejoicing too much over this. New "feudal lords" are succeeding the old one, and the scientists, who had gathered at the Physics Institute of the USSR Academy of Sciences, did not relish this at all. It is a question, first, of the Russian Academy of Sciences, which is being established in accordance with an ukase of Boris Yeltsin. Regardless of what it will be like in reality—good or bad—the scientific community, if we judge from the meeting at the Physics Institute of the USSR Academy of Sciences, is, to say the least, reserved and wary about it. First, they believe, judging from the principles which were made the basis of the Russian Academy of Sciences, this will be a

second-rate academy patterned after the union academy, only worse in quality. And its members, most likely, will also be more drab. Citing a member of the presidium (without mentioning his name), one of the participants in the meeting at the Physics Institute of the USSR Academy of Sciences asserted that the founders of the Russian Academy of Sciences intend to elect their membership mainly from among scientists of outlying areas, while they intend with all their might not to let people from Moscow and St. Petersburg in there. The talk that a portion of the institutes from the union academy will be transferred to the Russian Academy also greatly worries scientists. This may signify the collapse of the established system and, as a consequence, the collapse of academic science, that is, a catastrophe, the consequences of which one will have to bear for decades. But if you also consider the fact that the members of the union academy are burning more and more with the desire to return to it the former historical name that existed until 1925—the Russian Academy of Sciences (the meeting at the Physics Institute of the USSR Academy of Sciences also voted for this), it is even difficult to imagine to what cataclysms the clash of the outlying and capital monsters with identical names will lead.

The paragraph about asking Yeltsin to suspend the election to the new academy, which was set for the beginning of October—at least until the scientific community at its congress had specified its attitude toward it—was adopted practically unanimously as one of the paragraphs of the resolution that was passed at the meeting.

Those who had gathered also did not display enthusiasm with respect to Russian scientific authorities—the State Committee for Science and the Higher School and the commission of the RSFSR Supreme Soviet for science and education. Here I am forced to apologize to the reader, but I probably do not completely understand something. In no way can I see how these two departments so spited our scientists. At any rate, the point of view of the State Committee does not differ than much from the views expressed at the Physics Institute of the USSR Academy of Sciences. Scientists, judging from their statements, see in it something like an inferior, "minor" version of the State Committee for Science and Technology. And they state their opinion rather bluntly: "If we fall from the clutches of Marchuk and Laverov into the clutches of Malyshev and Shorin, then tanks will also not help." When I tried to find out from Aleksandr Tikhonov, first deputy chairman of the State Committee, the reason for such an attitude, he merely shrugged his shoulders. He believes that if the State Committee ever degenerates into a similar "feudal lord" structure, it will be necessary, undoubtedly, to eliminate it immediately. "We do not intend at all to give orders to scientific research," Tikhonov said. "Given the diversity of the forms of financing, including state financing, given the competitive approach, and given the introduction of the system of grants, with which we are now

actively dealing, the threat of the monopolization of science is small. Another thing is more serious—where is one to get the money for science? In all for Russia about 12 billion rubles [R] a year are spent on civilian science, of them our State Committee uses R1 billion. The remaining R11 billion were distributed between the State Committee for Science and Technology and 50 different sectorial ministries. Many of these sources of financing have ceased or in the immediate future will cease their existence. Who will now provide financing?"

The future, as always, will show who is right here and who is not. One thing is clear—it is fairly difficult under present conditions for our scientist to get a letter of enfranchisement. "Let the academies live by themselves," they said at the Physics Institute of the USSR Academy of Sciences, "and let us live by ourselves. Flies separately, cutlets separately. Let there be as many academies as you wish and what kind of academies you wish as elite scientific clubs—by all means!—only do not let them give us orders!" But how is this to be done?

Apparently, the time for decision making proper and for the effective influencing of decisions from above has been missed by a considerable amount. The congress in principle can settle these questions, but it should have settled them yesterday—thank you, Guriy Ivanovich. Moreover, as was noted at the Physics Institute of the USSR Academy of Sciences, this is a not too normal means—to convene the *veche* for similar cases. Roughly speaking, this is purely our, a purely Soviet means, but, to all appearances, today another one does not exist.

And, incidentally, this means is far from that simple and reliable. The deadlines are drawing near—according to calculations it is necessary that the congress be held not later than the end of October, but there is much work to do. There has just been established the working group, which will set up the organizing committee, which will draw up the agenda, which will be settled on in advanced with all academic institutes, which.... And it is still also unknown whether the decisions of the congress will be accepted by Russia. Most likely they will, the initiators of the congress have few doubts in this regard, but today everything is changing so rapidly....

Anyhow, the signal to start has been given, the race has been started, and this will surely be a mad race with a large number of obstacles, but the prize at the finish line, scientists believe, will be considerable—the survival of domestic basic science.

Lack of Leadership Noted

927A0046D Moscow *RADIKAL* in Russian
No 39, 9 Oct 91 p 2

[Article by Vladimir Pokrovskiy: "The Academic Temperature of the Week"]

[Text] The main result of the week is that Russia began to speak. Russia, at least on the consultative level, agreed to put the USSR Academy of Sciences down for an

allowance. Only it is unclear what to do with the offspring to which it is giving birth—the Russian Academy of Sciences, which is now being established.

All the references to the fact that the decision on this academy was made before the putsch, that is, "in a completely different country" and, thus, should be revised, though having the right to exist, cannot reverse the course of history. Whether we like it or not, two academies want to be called the Russian Academy and will not back down.

True, the solution of this paradox, it seems, has begun to appear.

On Tuesday, 24 September, another meeting of the presidium of the USSR Academy of Sciences was held. Contact between the "immortals" and the "informals," it appears, is being strengthened—representatives of the Club of Voters of the USSR Academy of Sciences and the big Union of Scientists were again invited to attend.

The presidium went on for four and a half hours and did not settle anything. The unanimity, with which during the week before academicians had decided to go "under Russia," had completely disappeared. The impression is forming that the spiritual outbursts of the members of the presidium, which force them at first to decide almost unanimously to remain in the hypostasis of the union organ, then, in exactly a week, to state absolutely unanimously their design to obtain a Russian status, and after another week to lose their heads altogether—that these spiritual outbursts do not entirely match up with the version proposed by Academician Velikhov. Let us recall—according to Yevgeniy Pavlovich, the first presidium for its members was a shock presidium. Later the academicians understood that they had made a mistake, something like civic conscience have begun to talk in them, and so on and so forth.

Today another version, which is somewhat more down to earth, looks more appealing. The members of the presidium with the constancy of a compass needle looked at who, in their opinion, with the greatest likelihood would give money for the academy. Noble outbursts were, of course, also present, but, it appears, in the parts of "dinner is served." Therefore, the first presidium, which was set at rest by the assurances of Guriy Marchuk that the union budget, consider, is in the pocket (since Gorbachev himself had invited him to the State Council), voted for union status.

The State Council as regards union status responded as a whole favorably, but did not settle anything definitively and did not give money. At the same time Russia seems to have unofficially made it understood that it has nothing against the transfer of the Academy of Sciences to Russian jurisdiction and, should something happen, would give money. The result is the unanimous decision of the second presidium on the switch to Russian status and the quickest convening of a general meeting of the academy in order to ratify this decision.

But then the "White House" fell silent and did not grant an audience to the leadership of the presidium. An audience was granted, contrary to expectations, by Gorbachev, who solemnly promised the academicians to finance basic research. But here is the third presidium, and again it is necessary to decide something. Only what?

Marchuk, according to our information, expressed regret that he had voted for Russian status. He began to assure the academicians that the decision of the second presidium does not signify at all the transfer of the academy to Russian jurisdiction, that in reality the academy, while remaining the union academy, had simply decided to return to itself the historical name "Russian." This trick, it appears, did not go off. Then namely Russian status and the practicability of Russian money were discussed. Academician Velikhov, who the day before this "was taken ill" with the idea of the Club of Voters of the USSR Academy of Sciences about a congress of scientists of the academy, did not retreat from his position, he spoke pointedly, even bluntly and in a most democratic key, which distinguished his statement favorably from the majority of others.

That, strictly speaking, is everything about the presidium. Hoping, however, that these lines will catch the eye of its members, and remembering that in general it is useful to know how you look to others, we will venture to keep the attention of the reader and will show this presidium through the eyes of one of the invited people—Leonid Keldysh, a member of the Club of Voters of the Academy of Sciences and an associate of the Physics Institute of the USSR Academy of Sciences.

Leonid Keldysh was at a meeting of the presidium of the Academy of Sciences for the first time. And the presidium made on it a "terrifying impression":

"Their (the members of the presidium) behavior is so unequal to the magnitude of the problems being discussed and they so do not understand that these problems concern all of us, and not just them, that it will be extremely difficult to break down this wall. First of all they are saving themselves. I, of course, understood with whom I was dealing, but such a degree of irrational egotism seemed simply gross to me.

"The members of the presidium do not have unity, they are now divided into four clans. First, this is the democratic part—the vice presidents, with whom we are in contact—and a small group of academicians, such as Keldysh, Gonchar, Fadeyev, in all about five people. The second clan is the 'regionalists.' The third is the presidium, which is trying to maintain its positions. And the fourth, rather large group is the 'diehard' reactionaries, who represent, perhaps, not so much academic institutes as institutes of the military-industrial complex. This part behaved simply defiantly. It is, apparently, practically impossible to work with them."

The meeting of the leadership of the USSR Academy of Sciences with Ruslan Khasbulatov and deputies of the

Russian parliament on 25 September was the main event of the week (from the standpoint of the academies).

You may have already read about this meeting in IZVESTIYA of 28 September, therefore, here we will confine ourselves to the solid residue, especially as our information is from the same source as that of IZVESTIYA—from Aleksey Zakharov, a member of the Club of Voters of the USSR Academy of Sciences, who was present there.

Many general words were said there about the fact that two academies, which are operating in a steady-state mode, are too much, that this will not lead to anything good, except confrontations, the division of property, and the other accessories of divorce. That it is necessary to save science. That it is necessary to support the establishment of the Russian Academy of Sciences. That the desire of the USSR Academy of Sciences to come back under the flag of Russia is entirely natural and can only be welcomed, although, of course, total democratization should be prescribed for this academy. The idea of the Club of Voters of the USSR Academy of Sciences about a congress of scientists was eagerly supported.

It is interesting that no one, except Deputy Sheynis, insisted any longer on the suspension of the election to the Russian Academy of Sciences—not like earlier. Incidentally, this is understandable—a new proposal, which is less, perhaps, palatable to the Academy of Sciences, but, it seems, is more realistic, appeared.

Yevgeniy Velikhov made this proposal. He believes that the USSR Academy of Sciences should be transferred fully to Russian jurisdiction. At the same time it is necessary to allow the new Russian Academy to be established and then to unite both before clarification under the temporary leadership of the organizing president, who has been appointed by the Supreme Soviet. This seems reasonable. The Russian Supreme Soviet, which has already made the decision on the establishment of the Russian Academy of Sciences and has appointed an organizing academician, will hardly reverse directions without very formidable grounds for this—Ruslan Imranovich, in any case, very much doubts this.

This proposal suited both parties and was supported by everyone, although several aspects of unification (its time and the regional principle of the organization of the Russian Academy of Sciences) resulted in a lively, but civil debate. For the reduction of the two charters to a single form Khasbulatov proposed to set up a conciliation commission.

In short, the matter is proceeding slowly, the academy seems not to be falling apart, and Russia seems to agree to look for money for it. All this, of course, is at the level of nonbinding words. So far no decisions have been made. This week the time of decision making had not yet arrived.

Burbulis, Velikhov 'Secret' Agreements Rumored

927A0046E Moscow RADIKAL in Russian
No 40, 16 Oct 91 p 2

[Article by Vladimir Pokrovskiy: "The Academic Temperature of the Week"—first paragraph is RADIKAL introduction]

[Text] To all appearances, the events of this week, that is, the week immediately preceding the general meeting of the USSR Academy of Sciences (it was planned for 9-10 October), if they are of value to our readers, will be only of historical value, inasmuch as practically everything, which will be discussed in this article, was preparation for this meeting.

The coordination of positions and meetings of different levels and different degrees of confidentiality continued. The academic community in the person, as usually, of representatives of the Club of Voters of the USSR Academy of Sciences, the Union of Scientists, as well as a number of deputies met with Russian State Secretary Gennadiy Burbulis and immediately after that with Vice President of the USSR Academy of Sciences Yevgeniy Velikhov. We have unverified information about continuing contacts between the Russian leaders and the supporters of the establishment of the Russian Academy of Sciences. The latter seem not to object to the merging of the two academies and are even expressing readiness for some rewording of Yeltsin's ukase on the Russian Academy of Sciences in order to make such a merger as painless as possible.

We do not know what happened at the meeting with Burbulis, this information, as they explained to us, is of a preliminary and, therefore, confidential nature. But at the meeting of the scientific community with Velikhov one very interesting proposal was heard. Yevgeniy Pavlovich told those who had gathered about the idea of suspending the activity of the presidium of the USSR Academy of Sciences and of establishing prior to the merger of the academies of a temporary commission for contacts with the Russian leadership.

The hidden point of this idea, in our opinion, reduces to the following. One need not count on the further existence of the USSR Academy of Sciences as a union structure. In spite of the assurances of Mikhail Sergeyevich that the union budget, its nose bleeding, will maintain the union academy, this is hardly realistic. Although it is the union budget, about 90 percent of the money for the academy was always Russian money. Today, according to our information, Russia is refusing to give this money. It agrees to maintain the academy only if it is Russian. Moreover, "to maintain" means to finance research and institutes, but not the bureaucratic administrative academic superstructure. The Russian authorities feel, everything seems to indicate, a strong and, it must be admitted, entirely valid distrust of the presidium of the Academy of Sciences. In any case the leaders of the Academy of Sciences, in spite of all their efforts, never got an audience with Yeltsin. The only one, whom Russia receives, is

Yevgeniy Velikhov. At any rate such an arrangement is suggested by the forming situation.

Therefore, it is logical to assume that the idea of suspending the functioning of the presidium comes from the "White House." It is even possible that it is an initial condition for subsequent talks.

Academician Velikhov at the meeting with the scientific community presented this idea as though it had already submitted for approval to all interested parties, including President of the USSR Academy of Sciences Guriy Marchuk. However, either what is desirable was passed off in this case as what is real or Yevgeniy Pavlovich did not fully appreciate the personal pluralism of Guriy Ivanovich, who is famous for his ability in the same day to express diametrically opposed views. Because on Tuesday, 1 October, when Velikhov submitted this idea for consideration by the presidium of the USSR Academy of Sciences, it turned out that Guriy Marchuk had vigorous objections to it.

In general for all its radicality and, perhaps, rationality, the idea of the temporary resignation of the presidium and the transfer of all authority to a temporary commission, which is left-wing in views, seems ambiguous and at least controversial. At any rate this idea did not evoke any enthusiasm in the presidium of the USSR Academy of Sciences. In the words of one of the academicians who attended this meeting (who out of ethical considerations does not wish to highlight his name in newspaper disputes), many of the members of the presidium did not understand very much what it was a matter of. Expressing ourselves in the nomenclature, the question proved to be unprepared.

Indeed, for all the unpredictability of the academy presidium it would have been difficult to expect from it any serious support of such a proposal. Come what may, provided the process of merging the academies would not take more than two to three months. But if the idea of merging does not please everyone and encounters resistance, which, according to some estimates, would prolong the transition period by two to three years, this looks more like self-dissolution. And on the average the conservative presidium has not become so feeble-minded as to agree to suicide and to turn all authority over to some, in its opinion, left-wing State Emergency Committee.

Therefore, the presidium with the already traditional unanimity (all "opposed," with one abstention) rejected the proposal and instead adopted its own—to establish all the same a commission, to intend it for contacts with the Russian leadership, which contacts they will maintain not together, but on behalf of the presidium of the USSR Academy of Sciences.

Unfortunately, we have been deprived of the opportunity to insist on the 100-percent reliability of what was just set forth, because the question of the commission was considered at the "closed" part of the presidium, the

information about which we obtained in bits and pieces. Incidentally, the incident with the commission, everything seems to indicate, in the near future will be, let us repeat ourselves, of purely academic interest.

The support by the presidium of the forthcoming congress of scientists of the academy was far more important. True, through the efforts of the presidium the congress was again renamed a conference—and this arouses suspicion. The reason for such terminological obstinacy of the highest academicians in general is understandable and has already been discussed on the pages of RADIKAL. A conference by virtue of its status discusses, while a congress makes decisions. The leadership of the presidium, to all appearances, puts its trust more in decisions from above, wherever they come from—from Gorbachev, from Yeltsin, from the military-industrial complex, from the Red Cross, or from the U.S. Department of Energy—inasmuch as it is possible if only in principle to control such decisions. While a congress, I am afraid, might hit upon the idea that the presidium is

not needed at all—what are the poor officials of the ministry of science then to do, what is there to distribute? After all, many of them are not made for the role of the most brilliant scientists, who constitute the **real** elite of our science and because of this alone have the right to an academy pension.

On the other hand, it does not make particular sense, it would seem, to insist in that way on a conference instead of a congress. A meeting, which is sufficiently legitimate, is entirely able to call itself a congress on the first day and thereby to reduce to naught all the terminological contrivances of our "immortals." And they cannot but realize this.

Thus, one has to assume that the academicians are hoping that the conference will not develop into a congress—due to inadequate legitimacy, due to claqueurs, or due to some other submerged mine, which will make the conference a helpless gathering of chatterboxes who are listing their misfortunes.

Basic Science Financial Needs Outlined*927A0078A Moscow RADIKAL in Russian
No 44, 13 Nov 91 p 1*

[Article by Marina Lapina: "Does Science Have a Budget-92?"—first paragraph is RADIKAL introduction]

[Text] It is pleasant to note: The necessity of supporting science, particularly basic science, was declared today from all the high platforms. B. Yeltsin should have discussed the practical steps in this direction with the new minister of science of Russia, N. Malyshev, and his colleagues.

Specific proposals on the organization and financing of science have been prepared in the State Committee for Science and the Higher School, which succeeded the union State Committee for Science and Technology, which is living out its last days. The old-timers and their successors for several weeks worked together in order to formulate these proposals and to determine the budget of Russian science, which is necessary for its survival next year.

According to the data of experts, it should come to 18 billion rubles [R] (with allowance made for the growth of inflation). The State Committee for Science and the Higher School plans to distribute this amount in the following way: R1.37 to the Basic Research Fund of Russia, R7 billion to conversion science, R2 billion for the establishment of the Technological Development Fund of Russia (the name for the present is provisional), and the remainder for priority scientific programs.

For the first time budget allocations for the development of the military sector are not envisaged in the list of expenditures on science—apparently, due to the complete confusion in this area. Last year these expenditures came to R12 billion of the R26.5 billion, which were allocated from the union budget for science as a whole. Moreover, conversion ate up R8 billion, purely civilian science ate up R6 billion (it was planned to spend R3 billion of them on state scientific programs and another R3 billion on the establishment of the USSR basic research fund, which both did not and does not exist, and now will not exist. Meanwhile, the question: On what was this money spent? is appropriate.)

Thus, the new structure of Russian science provides for the establishment of the Technological Development Fund of Russia (in another wording, the Restoration Fund of Russia), the total outlays on which, according to preliminary estimates, should come to R3.9 billion. In addition to budget money, this will be allocations of various commercial and departmental structures, which are interested in the development of scientific research. In turn the fund will make available, for example, preferential credits and will render other services.

The idea of a basic research fund is not new. It must be assumed that in contrast to the union fund, which died while still in the womb, the Russian fund all the same will be established.

As for scientific programs, according to the available information, there is not yet sufficient clarity with regard to this point. Until recently 20 priority state union programs, 11 Russian programs, the level of which as a whole is, undoubtedly, lower, and five absolutely new programs, which were proposed by the newly fledged leaders of Russian science, existed. The list, undoubtedly, needs revision and specification. It is impossible to provide all 36 programs with the proper financial support. We have to clarify what refinements will be made in this list. We hope in the next few issues to familiarize the readers of RADIKAL with them.

After the meeting with Yeltsin, perhaps, other provisions of the prepared documents, as well as the total amount of the allocations for science will also undergo changes. Judging from the preliminary discussions in the lobby of the Russian government, they are promising to satisfy nearly completely the request for science—to allocate if not R18 billion, then at least about R15 billion. According to the forecast of specialists of the State Committee for Science and Technology—the State Committee for Science and the Higher School, this amount will be sufficient to ensure the tolerable maintenance of Russian science—at least at the level of this year. We will hope that the promises of the Russian leaders to give science the maximum support will not remain unfounded.

American Financial Support Saves X-Ray Optics Institute*927A0059A Moscow RADIKAL in Russian
No 42, 24-30 Oct 91 pp 6, 7*

[Interview with Muradin Abubekirovich Kumakhov, director of the Institute of X-Ray Optical Systems, by Aleksandr Polikarpov; date and place not given: "'Kumakhov Lenses' in the Frame of Reality"—first paragraph is RADIKAL introduction]

[Text] The appearance of a new scientific institution in Moscow, which is oversaturated with them, previously also did not go unnoticed, giving rise to rumors and gossip. It is all the more so now—in the financial shortage, when research programs are being curtailed and themes are being cut off, when at scientific research institutes there is only talk about who will come under the reduction of staffs and from whom this cup will pass. And that is why my first question to Muradin Kumakhov, director of the Institute of X-Ray Optical Systems (IROS), is: On what, pardon me, money?

[Kumakhov] I would not begin with money. We will talk about it a little later. In recent times you have heard more and more often about our hopeless poverty and backwardness, about the fact that science in our country will not survive, that it is beyond our means.... In many

cases, alas, these are correct statements. But here one must on no account be unspecific. For in no fewer cases it is possible to show our works of a world level, often unique works. The question is: How is one not to squander this potential for nothing.

We, for example, have learned to control X-rays—to organize them into parallel beams, to turn them at a given angle, to focus them.... That is, our institute is, first of all, the ability to do what is considered...technically impossible.

[Polikarpov] In such a case, without asking about the details that constitute the know-how, could you say a few words about your miracle lens?

[Kumakhov] The history of the development of the X-ray lens is not a 15-minute narrative. And I, here you are right, will try to avoid questions regarding the know-how. We are thus far the only ones in the world, who know a rather simple, reliable, and comparatively safe method of working with hard radiation.

The essence of the method is simple. Here I will draw two parallel lines and between them a broken line. This is the path of X-rays between ideal surfaces. Repeatedly reflected at negligible angles, they do not come out, but proceed, like petroleum in a pipeline, in a given direction. The internal surface of glass capillary tubes has a surface that is close to an ideal surface. The X-ray lens is 10,000 30-micron capillary tubes that are oriented in a specific way in space. If you place these capillary tubes side by side, you will get at the outlet a quasiparallel beam. If you set some angle of convergence, the possibility of focusing will appear. The whole question is, how is all this to be done? But here, pardon me, it is not free of charge....

[Polikarpov] Where in practice is your X-ray "light spot" or the neutrons set into motion along the string applicable?

[Kumakhov] A month does not pass before the next idea of the use of the lenses appears. In ecology—for analytical purposes. In electronics—for the development of a new generation of microcircuits. In metallurgy, in chemistry, in medicine....

It is necessary to talk about it in a little greater detail. We chose namely medicine for the specialization of the institute. Because the two most important qualities of X-ray optics—the locality of irradiation and its dosed nature—dictate its use first of all there. Several instruments, the industrial production of which it would be possible to organize in two to four years, have already been developed. First, diagnostic instruments for the early detection of vascular and heart diseases, cancerous tumors, particularly breast cancer, and brain disorders. Moreover, we incorporate in the concept "early detection" a slightly different meaning than is customary in medicine. According to our criteria, it signifies diagnosis several months or years before the disease will develop to the stage of detection by traditional methods.

Then there are therapeutic instruments for the treatment of oncological diseases. The lenses are also affording here previously unavailable possibilities. Imagine: Instead of a risky surgical operation of exquisite precision there is a "salvo" at sick cells, and the sarcoma has been eliminated.

[Polikarpov] It is possible to imagine the enthusiasm of patients and physicians. Precisely medical personnel probably jumped at your proposal!

[Kumakhov] They would not dream of it. No reaction! When we say: Our X-ray devices will give half as great a dose of radiation as the best German or Dutch devices, not to mention domestic ones, which are simply hazardous to the health, they respond to us: So they will be more expensive....

However, it is possible to understand this. The state did not give and is not giving money for health care. To subsidize the development of a new direction of medicine—the X-ray optical direction in this case—means to reduce the financing of others. Trishka's coat!

When we tell about that in America, we hear: Oh! That is quite something! It is necessary to invest assets here! And they are investing. The institute received from the Americans a grant for the joint development with them of instruments and devices with X-ray lenses, or "Kumakhov lenses," as they call them.

[Polikarpov] Muradin Abubekirovich, in April American newspapers reported the presentation of the "Kumakhov lens" in the United States. Why namely there, why not in the homeland?

[Kumakhov] Because the Americans helped us with the patenting and provided currency. And one of their conditions provided for the demonstration of the commodity, as they say, to advantage. In general the companies and laboratories there gave us vigorous support.

We could not have achieved any of the foregoing in the homeland.

[Polikarpov] Is your institute on budget financing?

[Kumakhov] No. It was founded by the World Laboratory, an international organization which works on problems that are connected with the development of the basic sciences, the humanities, and ecological research as a public organization. The initiative of its establishment belongs to Yevgeniy Velikhov, chairman of the Moscow Branch of the World Laboratory and director of the Institute of Atomic Energy.

[Polikarpov] How do you propose to live? Are you counting on state credit? Sponsors? Cofounders?

[Kumakhov] We have received from American companies the proposal to finance the entire program of the development of X-ray optical instruments of various types. However, according to international law whoever has invested the assets in production receives the entire

profit from the sale of the commodity. But we would not like to lose "controlling interest." Therefore, we are seeking investors in our country.

We have despaired of finding common ground with union state structures. However, the Russian Government supports us, for the present, it is true, only morally.

[Polikarpov] Tell me, are you not afraid that one fine day the state will make its own claims to the revenues of the institute? After all, the discovery that is "feeding" it was made at a state institution, on state equipment, and at state expense. How do you intend to protect your intellectual property?

[Kumakhov] The rights to the use of the method of controlling hard radiation until recently belonged to the Kurchatov Institute. But now they have been transferred to us on the basis of an understanding between me and

Velikhov, with the condition of subsequent settlements upon their acquisition. No misunderstandings are foreseen here.

[Polikarpov] I cannot help asking you another question. Does not conversion have something to do with the appearance of your institute?

[Kumakhov] It does. The whole ideology of X-ray optics is "from there," and the institute team, which has, I will note, the mightiest intellectual potential, also is.

[Polikarpov] Do what has been said and the very fact of the appearance of the Institute of X-Ray Optical Systems mean the halt of work on the special theme in the USSR?

[Kumakhov] We did everything necessary for the defense of the country. Now it is a matter of ensuring the well-being of its citizens.

New Organizations Replace Ministry of Radio Industry

927A0095A Moscow MOSKOVSKIYE NOVOSTI
in Russian 29 Dec 91 p 10

[Article: "The Ministry of the Radio Industry No Longer Exists. With Whom To Deal Now"]

[Text] The defense complex is disintegrating and is changing the administrative diagrams, concerns, corporations, and associations are being established in place of former ministries. Potential and, at times, old clients do not know where to turn. "Business of MOSKOVSKIYE NOVOSTI" will help you. Today we are publishing the contact telephone numbers of the structures that were established in place of the former USSR Ministry of the Radio Industry. In subsequent issues we will tell about the same kind of changes in other sectors of "defense."

The Department of the Radio Industry, Which Is Part of the Complex of the Defense Industry

The Russian "RADIOKOMPLEKS" Corporation of Producers of Radio Electronic Systems and Complexes (Moscow)

President—Vladimir Ivanovich Shimko

Telephone number: 207-60-00

The "Avtomatizirovannyye radioelektronnyye sistemy" (AvtoRES) Scientific Production Concern (Moscow)

President—Vladimir Ivanovich Gladyshev

Telephone numbers: 132-12-11, 208-99-61

The Russian "Mashinostroyeniye, avtomatika, radioelektronika, svyaz" (MARS) Concern (Moscow)

President—Aleksandr Petrovich Vrublevskiy

Telephone numbers: 207-98-87, 924-85-02

The Russian Association of Computer Technology (Moscow)

President—Ernst Rodionovich Filtsev

Telephone number: 207-96-96

The Association of Manufacturers and Developers of Household Radio Electronic Equipment (Moscow)

President—Georgiy Pavlovich Kutsenko

Telephone numbers: 207-98-86, 207-99-26

The "RADTEKHMASH" Scientific Production Concern (Moscow)

President—Boris Nikolayevich Bogdanov

Telephone numbers: 207-99-86, 207-98-92

The "RADIOEKSPORT" Foreign Trade Association (Moscow)

General director—Boris Petrovich Saltykov

Telephone number: 923-79-49

The "RADIO SVYAZ" Concern (Moscow)

President—Yuriy Stepanovich Gusev

Telephone number: 207-91-51

The "RADIOSTROYKOMPLEKS" Association (Moscow)

Telephone numbers: 207-99-61, 208-97-03

The "RADIOAVIONIKA" Association of Developers of Airborne Radio Electronic Systems (St. Petersburg)

Chairman—Anatoliy Aleksandrovich Turchak

Telephone number: 293-71-78

Reorganization Plan for Academy Institutes Proposed

927A0095B Moscow RADIKAL in Russian
No 47, 4 Dec 91 p 6

[Article by Doctor of Chemical Sciences Sema Ioffe: "The Principles of the Organization of the System of Scientific Institutions of the Academy of Sciences"]

[Text] Inasmuch as the establishment of the serious plight, in which the Academy of Sciences and all our basic science have now found themselves, and the criticism of the existing system of the management of the Academy of Sciences have become "general characteristics," I think it is advisable to omit in the publication this part of the concept.

In the immediate future the majority of scientific research institutes of the system of the Academy of Sciences will not survive without having a stable system of base financing, which takes into account the inflationary process.

Not the specialization—the conducting of basic research—but **affiliation with the system** of the Academy of Sciences is the main attribute of institutes of the Academy of Sciences, which distinguishes them from other scientific institutions. (The very definition of the concept "basic science" is very difficult to put in words.) Therefore, the withdrawal of institutes from the system of the Academy of Sciences even on the condition of the formation of an association or associations will complicate the satisfaction of their claims for base financing. Other types of scientific institutions, higher educational institutions, and sectorial scientific research institutes, which among other things also conduct basic research, can also make similar claims.

Hence, at least for the transition period, the institutes, which claim base financing, should remain in the system of the Academy of Sciences, while the community itself of the Academy of Sciences should be closed. Other

scientific communities have their own means of survival. Subsequently, with recovery from the crisis, the integration of various communities may become more advisable. (Although now associate membership in the system of the Academy of Sciences without base financing is also possible.)

The extensive participation in the management of the scientific community of what are called "middle-level scientific personnel" without any personal gains and without giving up scientific activity in case of the frequent change of personnel actually seems like a utopia, as least in the majority of cases. By the time of rotation these "men condemned to die" will have a substantial loss of scientific skill and will not acquire very much as administrators. Therefore, the main task of "middle-level scientific personnel," who are sent as delegates to organs of management, is the **control function and the representation of the interests of their own community.**

The basic reformation of the system should be accomplished by the replacement of not so much specific people as the principles of its functioning. Management should be brought closer to the present base unit—the scientific research institute, the independence of the scientific research institute should be increased sharply, while within the scientific research institute the role of creative collectives and individual associates should increase and their right to scientific independence should be recorded.

It is necessary to change management so that the scientific research institutes of the Academy of Sciences would become self-organizing and capable of adapting quickly to the change of external conditions.

In the charter of the Academy of Sciences it is necessary to define clearly two concepts, which describe the partially overlapping scientific communities—the Academy of Sciences and the system of scientific institutes of the Academy of Sciences.

Academicians and corresponding members, who have been elected in accordance with the charter and are managed by the presidium of the Academy of Sciences, which is elected by and is subordinate to them, should be members of the academy. The scientific associates of the scientific research institutes of the Academy of Sciences regardless of their title and position should be a part of the system of the Academy of Sciences. At their congresses they elect from among the candidates, who are recommended by the bureaus of professional associations, the periodically replaced **lower chamber**—the main organ of management, in which the main scientific disciplines are equally represented.

The basic tasks of the lower chamber, which are important for the scientific research institutes of the system of the Academy of Sciences, are:

a) the distribution of budget and sponsor financing among scientific disciplines;

b) the formation of the staff which serves the system of scientific research institutes of the Academy of Sciences;

c) the submission of justified applications for budget financing to state instances.

The Academy of Sciences and the system of scientific research institutes of the Academy of Sciences have common property—information departments, service departments, and the like, as well as institutions of the social sphere. The management of this property is carried out jointly by the presidium of the Academy of Sciences and the lower chamber.

The scientific research institutes of the system of the Academy of Sciences form professional associations, which choose at conferences elected representatives of the bureaus of the associations, who are relieved no less often than once every five years.

The basic tasks of the bureaus of professional associations are:

a) the determination of the ratio between base and grant financing;

b) the getting of basic financing to individual scientific research institutes;

c) the formation from the **Institute of Experts** of temporary expert councils for the drawing up of applications for grant themes and for the distribution of grant themes among creative collectives;

d) the coordination of the domestic and international activity of scientific research institutes, the establishment of common information and other service centers. The creative independence of scientific laboratories and individual associates is guaranteed by the possibility of obtaining direct financing through grants and competitive scientific programs.

About Financing

Financing is divided into base, grant, and competitive financing.

The base financing for 1992 should come to not less than 70 percent of the budget outlays of scientific research institutes for 1991 (with allowance for inflation). With the establishment of alternative funds it is necessary to reduce the share of base financing substantially, so that it would only cover the supply of scientific research institutes with electric power, water, and so forth, as well as the payment of the wage at rates that are not less than the official subsistence wage.

Grant financing is formed from a portion of the budget assets and the nonspecific contributions of sponsors. It is distributed among creative collectives in accordance with the decisions of the expert councils. Grant financing can also be carried out from special international funds in accordance with the rules of these funds.

Competitive financing is financing by objective and is carried out from the assets of state programs or sponsors in accordance with the rules that have been drawn up by the holders of the assets. International competitive financing is also possible.

The Formation and Work of the Expert Councils

A rating, in accordance with which a quota at the Institute of Experts is allotted, is being introduced for each scientific research institute. In accordance with this quota the scientific councils of scientific research institutes elect experts or send them as delegates to the Institute of Experts.

From the experts of this institute the bureaus of professional associations form expert councils, which examine the applications of individual creative collectives for grant themes, select the ones deserving financing, and rank them according to importance. The list of such applications is referred via the lower chamber to the financing organ.

After the receipt of real allocations the bureaus of professional associations form from the membership of the Institute of Experts new temporary expert councils, which distribute the sums of the allocations on the basis of the previously compiled lists. In consultation with the applicants these councils also distribute competitive financing. The work of the councils is public, the work of the experts is paid for.

The common basic research fund should only distribute budget financing among scientific communities and finance state programs. If such a fund were charged to distribute grant financing throughout Russia among individual scientific associates or creative collectives, not the decrease, but the increase of monopolism in science, as well as the increase of bureaucracy and formalism would occur.

About Property

The land and a part of the fixed scientific capital are being transferred to the full ownership of the scientific research institutes of the system of the Academy of Sciences.

The other part of the fixed capital, which is proportionate to the amount of base financing, remains the corporate property of the system of the Academy of Sciences. With the reduction of base financing its amount decreases. Unique objects and facilities in accordance with a list permanently remain the property of the system of scientific research institutes of the Academy of Sciences. Objects of national property are included on another list. The present service, information, and social institutions of the Academy of Sciences remain the common corporate property of the Academy of Sciences and the scientific research institutes of the system of the Academy of Sciences.

About the Rights of Scientific Research Institutes

Under the difficult conditions of the transition to a market given the obviously inadequate financing the institutes of the Academy of Sciences should obtain additional opportunities for survival. They will operate on the basis of their own charters. I have already written in POISK (No 23, 31 May 1991) about the peculiarities of the behavior of scientific research institutes under the conditions of the transition to a market.

Scientific research institutes have the right to organize cooperatives and small enterprises, to take part in corporations and so forth. The activity of such subsidiary enterprises will not fall under tax credits and should be regulated by Russian laws on enterprises.

Scientific research institutes have the right to conduct foreign activity (contracts with foreign companies, firms, and other institutions).

Given the lack of sufficient financing scientific associates have the right to earn a living, using the equipment of the institute with the payment of a tax to the budget of the institute.

The institute, which does not conduct basic research, that is, which does not participate in grants and competitive programs, on the basis of a decision of the bureau of the professional association after a public examination can be deprived of base financing, closed, or reorganized.

The institute has the right to withdraw from the system of scientific research institutes of the Academy of Sciences in accordance with a special procedure. Here the corporate property, which is under its jurisdiction, is subject to redemption or transfer to the system of scientific research institutes of the Academy of Sciences.

The intellectual property, which has been developed by associates of scientific research institutes in the process of work and does not come under patent law, belongs to the developers, if not otherwise stipulated by the charter of the institute or by contract.

About Legislative Acts

For the successful functioning of the system of scientific research institutes of the Academy of Sciences under present conditions the following laws or acts similar to them are necessary:

- a) a law on the transfer of land and structures to the ownership of the system of scientific research institutes of the Academy of Sciences with the right of subsequent transfer to the possession of institutes with exemption from taxes;
- b) a law on the exemption from taxes of the currency, which has been earned by scientific research institutes of the Academy of Sciences, on the condition of its reinvestment in the scientific process;

c) a law on privileges in case of the taxation of entrepreneurs and other sponsors of basic science;

d) a law on international funds for assistance to basic science in Russia.

About Problems

The following difficult problems are submitted for discussion by the scientific community:

a) how to divide budget financing among scientific disciplines;

b) the method of division base financing among institutes, as well as the method of finding the ratio between grant and base financing;

c) the determination of the rating of an institute.

About the Means of Reforming the Academy of Sciences

Along with single-stage reformation stage-by-stage reformation is also possible. In this case at the first stage amendments to the charter of the Academy of Sciences are made, which establish the presence of scientific associates on the staff of the Academy of Sciences and the inclusion of elected representatives of scientific collectives in the general assemblies and in the bureaus of departments on a par with members of the Academy of Sciences; the election of a new presidium of the Academy of Sciences from among the candidates, who have been nominated by the renewed assemblies of the departments at the general assembly, which includes representatives of scientific research institutes; the establishment of the Institute of Experts and temporary expert councils. At the second stage (in approximately two years) all questions, which are connected with the activity of scientific research institutes, turn into a function of the lower chamber and the bureaus of professional associations, and the functions and composition of the staff of the Academy of Sciences are also revised.

V.K. Finn, V.N. Olshanskiy, A.V. Drozdov, and A.V. Kalinin took part in the preparation.

Beneficial Aspects of 'Brain Drain' Noted

927A0075A Moscow NEZAVISIMAYA GAZETA
in Russian, 26 Nov 91 p 6

[Article by Doctor of Physical Mathematical Sciences Yuriy Kabanov under the rubric "Opinion": "It Is Not Necessary To Prevent Departure. The 'Brain Drain' Has Its Advantages"]

[Text] The "brain drain" is inevitable, it is useless to hamper it, inasmuch as society, which is in a state of crisis, all the same cannot use these brains. The conclusion: It is necessary to use the control actions on this process in such a way that it would not do irreparable harm to the country in the long run, but would provide in the future a positive impact.

However paradoxical this sounds, the "brain drain" can be a factor that stabilizes the degradation of our system of education. The material and moral success of Soviet scientists abroad can return prestige to education and serve as a stimulus for young people to realize their personality in highly intellectual fields of science. The problem of "whom to teach," and not "who is to teach," in my opinion, is the basic danger in case of the reproduction of the elite. It is possible to disagree with the point of view that as a result of the "brain drain" in science "C students" will rule over the ball and they will teach young people. This is far from the case: The average level of professors and instructors at any rate at higher educational institutions of the capital is high enough to ensure the good-quality reproduction of specialists. The freeing of places in addition will lead to the mobilization of their latent potential.

In a certain sense the "brain drain" is a kind of deposition of the "gold fund" of Soviet science, which ensures its constant renewal. In connection with this it seems advisable to seek assistance of the West for the support of educational programs, in particular, to provide tens of thousands of truly gifted boys and girls the opportunity to obtain an education at leading European and American universities, so that they could return in five to 10 years to the country, which, as we hope, will be able by this time to cope with economic and political difficulties and will urgently need scientific personnel of the highest skill. Many developing countries, including India and China, are adhering to an orientation toward such a system. As for financial subsidies, it will be significantly easier to obtain them for the indicated purposes than credits for the development of industry in the republics, which are in a state of complete political and economic destabilization, especially as the financing will take place through other channels. Of course, here the support of our system of education is also anticipated.

The indicated system may evoke the protest that in this way the country will incur losses in connection with the irreversible emigration of personnel. Costs of this sort are inevitable. However, as practical experience shows, a negligible percent of those people, who received an education there, remain in the West. This year of 2,000 undergraduates only 11 remained abroad. On the other hand, it is necessary to pay for the solution of the problem of forming positive social reference points, and it is better to do this by means of renewable resources than by the selling off of natural resources.

'RADIKAL' Reports Recent Organizational Developments in Science

927A0058A Moscow RADIKAL in Russian
No 42, 24-30 Oct 91 p 1

[Article under the rubric "A Fact for RADIKAL"]

[Text] Let Us Reforge Soviet Bombers Into French Washing Machines

The development of a program of cooperation in the area of conversion—such is the goal of a trip to France of leading specialists of the military-industrial complex of the country. The composition of the delegation and the dates were specified today (22 October 1991) in the Science-Industry Union. Such an official visit is being made for the first time. It became possible as a result of talks of the leaders of the Science-Industry Union (NPS) and Patronat Francais (the Council of French Employers).

In the delegation, which is headed by Boris Kurakin, general director of the Science-Industry Union, there are 30 people: well-known scientists and executives of the largest enterprises of the military-industrial complex. Among them are Aleksey Tupolev, Yevgeniy Fedoseyev, Nikolay Mikhaylov, and Anatoliy Kuntsevich. During the five days of the official visit (27 October-1 November) they have to discuss with their French colleagues the concepts of conversion of the two countries, particularly their economic aspects, and to hold talks with Francois Perigot, president of Patronat Francais, and Minister of State for Economy Beregovoy.

As specialists of the Science-Industry Union report, today such well-known firms of France as Thomson and Alcatel are expressing interest in placing their technologies at converted enterprises. The companies Mulinex and SEB are prepared to produce modern electrical household appliances (washing machines, multipurpose kitchen machines, sporting equipment) on the basis of enterprises of the Soviet military-industrial complex. BSN, which produces equipment for the food industry, and the metallurgical companies Pechene and Aerospecial also have a great interest in our defense plants.

The Organizing Committee of the Conference of Scientists of the Academy of Sciences Has Been Established

This took place on 15 October, practically immediately after the General Meeting of the USSR Academy of Sciences, at which the decision on holding the conference was made. The circulation of an information letter among all the scientific institutions of the academy was the first act of the organizing committee.

In the letter, first, the composition of the organizing committee is reported. Representatives of the presidium of the Academy of Sciences and people's deputies were included on it, but for the most part these are representatives of the academy community. Yevgeniy Velikhov and Aleksey Zakharov (the Club of Voters of the USSR Academy of Sciences [CVAS]) became the cochairmen of the organizing committee, Emil Tabagyan (the CVAS) and Chief Scientific Secretary of the Presidium of the Academy of Sciences Igor Makarov became the deputy cochairmen.

Five working groups, to which there was assigned the preparation of the five basic issues that are proposed for discussion at the conference, were formed:

- the organization of basic science in Russia, the role of the Academy of Sciences in the system of state and interstate relations;
- problems of economics, questions of financing and property at institutions of the system of the Academy of Sciences;
- the rights and social protection of the scientist;
- the legal foundations and charter principles, which regulate the activity of scientific institutions of the Academy of Sciences;
- problems of the migration of scientists and international cooperation.

The proposed date of the start of the conference—the beginning of December of this year—is also indicated in the information letter.

There were included on the organizing committee, in particular, Academicians Andrey Gonchar, Leonid Keldysh, Vladimir Kudryavtsev, Nikolay Lyakshiyev, Gennadiy Mesyats, Andrey Mirzabekov, Oleg Nefedov, Yuriy Osipov, Yuriy Ryzhov, and Stanislav Shatalin, as well as RSFSR People's Deputies Nikolay Vorontsov, Viktor Sheynis, and others.

An Agreement Will Have To Be Reached

In the RSFSR State Committee for Science and the Higher School a working group under the chairmanship of N. Malyshev, the new head of the committee, has been set up. It has been charged by 1 November to formulate the basic principles of the organization, management, and financing of science of Russia. Representatives of the former union State Committee for Science and Technology, who until recently held the reins of government in their hands, as well as those people, to whom they were transferred after the elimination of the union department, belong to the group. On several items their points of view do not coincide. Perhaps, it will not be possible to achieve complete mutual understanding, but in one way or another by the indicated date the document should be submit for consideration to Russian President B. Yeltsin. RADIKAL will familiarize the readers in the next few issues with the key provisions of this document, which is of fundamental importance for the fate of Russian science.

We Give to Vermont, Vermont Gives to Us

An agreement on joint scientific research in chemistry, geology, and ichthyology has been concluded between the Academy of Sciences of the Republic of Kyrgyzstan and the University of Vermont (the United States).

In accordance with the agreement, a group of scientific personnel of the republic will be afforded the opportunity to study free of charge in graduate studies and

doctoral studies of this American educational institution. The participation of American colleagues in expeditions, which will be organized by chemists and geologists of Kyrgyzstan, is proposed. This work has already begun, and American scientists have already been on expeditions through Issyk-Kul and Naryn Oblasts.

To Whom Will Baykonur Pass?

Foreign capital, perhaps, will take part in the financing of Soviet space programs, Anatoliy Shalvarov, deputy chairman of the State Committee for Economics of Kazakhstan, stated. In his words, "the possibilities of establishing at Baykonur an international joint stock company for the efficient use of the potential of the cosmodrome are being discussed at the highest level." The cosmodrome will hardly be privatized, but the formation of individual complexes or programs into joint stock companies is quite likely, since none of the republics is capable of taking upon itself all the work on space research. In the opinion of Shalvarov, Kazakhstan, Russia, and the Ukraine, the total share of which in space research comes to 92-94 percent, will conclude among themselves a special agreement on Baykonur, to which, apparently, other republics will also be able to become a party. In conformity with the Ukase of Kazakh SSR President Nursultan Nazarbayev of 11 September 1991 an agency, to which the formulation and implementation of the space program, the coordination of the activity in this area of republic organizations and enterprises regardless of their departmental affiliation, as well as scientific, technical, and economic cooperation with associations, enterprises, and organizations of the sovereign republics and with foreign partners in the space research program have been assigned, is now being established in the republic.

According to some data, the chairman of the USSR Main Administration for the Development and Utilization of Space Hardware will become the director of the Space Research Agency of Kazakhstan.

Thus far the agency has not yet set to work—probably because the principles of the subsequent operation of the Baykonur cosmodrome will be the subject of special talks of the sovereign republics, since as of 31 August 1991 the Baykonur cosmodrome in accordance with an ukase of the President of Kazakhstan was transferred to the jurisdiction of the republic.

The facts were prepared from the reports of regional newspapers and the POSTFAKTUM agency and by RADIKAL correspondents.

Polls Reveal Employment Concerns of Scientific Workers

927A0049A Moscow RADIKAL in Russian No 39, 9 Oct 91, No 40, 16 Oct 91, No 41, 17-23 Oct 91

[Article in three installments by Vadim Sazanov, Nikolay Popov, and Rusina Volkova under the rubric

"The RADIKAL-Exchange"—first paragraph of each installment is RADIKAL introduction]

[No 39, 9 Oct 91 p 6]

[Text] This Cup Does Not Pass From Them

General discussions of unemployment are taking place in the country. On 1 June they flung open the doors of the labor exchange. Will scientists and figures of science be drawn there with time, or will the threat of being out of work pass them over? The opinion in this regard of Moscow scientific workers was ascertained during a face to face poll, which was undertaken to the order of the weekly RADIKAL.

The sample was based on the grouping of scientific research institutes according to the latest edition of the telephone directory "Moscow 1989-1990," as was reported in No 23 of the weekly. Twenty five departmental institutes, 15 institutes of the system of the USSR Academy of Sciences, and five institutes from the Academy of Medical Sciences were chosen at random. Three institutes represented the All-Union Academy of Agricultural Sciences imeni V.I. Lenin and two represented the RSFSR Academy of Pedagogical Sciences. The poll was also conducted among scientific associates of five Moscow higher educational institutions. One representative each of all five levels of the official hierarchy: junior scientific associate, scientific associate, senior scientific associate, lead (chief) scientific associate, and director of some scientific subdivision of the institute, was interviewed at each institute. In all 272 questionnaires were accepted for processing.

Fifty seven percent of the respondents are men; 9 percent are under the age of 30, 25 percent are 30-39 years old, 32 percent are 40-49 years old, 27 percent are 50-60 years old, and 7 percent are over the age of 60. Thirty seven percent of the respondents do not have an academic degree, 50 percent are candidates of sciences, 13 percent are doctors of sciences. Seventy-eight percent have a family, with children: 44 percent have one child, 34 percent have two or more children. Fifty two percent of the respondents were born in Moscow. Sixty five percent do not consider themselves religious; 17 percent are believers and profess Orthodoxy; 3 percent belong to other confessions; 15 percent at present cannot say anything specific about their religiosity.

There Is Rumbling Nearby

Looking around and observing their colleagues, scientists understand that in the last year or two more and more people in their circle have begun to be afraid of losing their job. Only 25 percent of the respondents did not notice an increase of such apprehensions. For 68 percent it did not raise any doubt. And this is not claps of thunder in the distance. In the opinion of the majority, there is rumbling nearby: In the opinion of 69 percent of the surveyed men and 79 percent of the women, the real threat of mass dismissals of scientific associates exists. Only 29 percent of the men and 19

percent of the women deny the existence of such a threat. The latter, consequently, sense more keenly the impending danger and are experiencing in this connection greater discomfort than male scientists.

Apparently, someone's position in science is better and someone's is worse, if we talk about the prospect of being out of work. In the opinion of 45 percent of the respondents, departmental and sectorial institutes of union subordination will most likely be faced with the need to reduce their personnel. In Moscow, let us recall, there are more than threefold more of them than institutes of the system of the USSR Academy of Sciences (RADIKAL, No 23). But the probability that associates of academic institutes may be the first out of work is precisely small. Only 13 percent of the survey participants supported this version. Finally, 9 percent are certain that the threat of dismissals is most urgent for scientists who are employed at departmental (sectorial) institutes of nonunion subordination.

It is interesting that associates of departmental institutes dramatize their own situation, while personnel of academic institutions sound the alarm even more loudly when talking about themselves. The higher the respondent is in the official hierarchy, the more often he is certain that the main danger is on the doorstep of precisely departmental institutes.

Of scientific institutions of the applied and basic type the latter will incur greater losses of people. Forty four

percent of the surveyed scientists indicated this. Eighteen percent think that primarily applied science will suffer, while 30 percent are certain that fate will strike an equally serious blow to both.

If we divide the sciences into the natural sciences and the humanities, first of all institutes of the humanities direction will have to reduce their personnel (54 percent of the respondents). Ten percent see particular difficulties for natural science institutions, while 29 percent are certain that the reduction will equally affect the natural sciences and the humanities.

And when will the catastrophe—the mass dismissal of scientists, which they so fear—break loose? Will scientists have time to breathe in the air of spade work and spread for themselves some straw before they die? The general opinion of the respondents is as follows: There is no time for slow preparation—if mass reductions do not begin before the end of this year (23 percent do not rule out such a possibility), they will probably occur next year (32 percent). Thirteen percent think that scientific associates still have about two to three years to spare. In the opinion of 6 percent, scientists in general have nothing to worry about, because mass dismissals simply will never begin. But 25 percent could not say either yes or no. This is natural—in any surveys far from everyone has enough resolve to localize possible events in the time perspective.

Table 1 acquaints us with what scientists will do, if they are suddenly out of work.

Table 1

Responses to the question: "How, in your opinion, will scientists and scientific personnel basically react, if a mass dismissal begins at scientific research institutes? (percent of respondents; it was possible to give more than one response)

They will try to find an equivalent job	57
They will try to go abroad	43
They will work in the private sector of the economy, in business	42
They will change occupation, will undergo retraining	14
They will transfer to a job in production	8
They will engage in agriculture, farming	2
I find it difficult to respond	6

A large portion of the scientists will not abandon their occupation. They do not see themselves outside science. However, many will move slowly abroad—also, perhaps, under the influence of the aspiration not to lose their place in science.

No smaller a share will display the willingness to acquire the new occupation of businessmen. Incidentally, in our study of the leaders of the Moscow alternative economy, which was made not that long ago, we established that more than 20 percent of the new businessmen are recruited precisely from among scientists of academic and sectorial institutes.

And only a negligible portion of the scientists will agree, according to the conjectures of the respondents, to

transfer, having changed occupation, to a job in production and agriculture—that is, to avail themselves of what they can offer them on the labor exchange.

I Am a Completely Different Matter

Let us recall: In speaking about the scientific community, nearly three-fourths of the respondents considered the threat of mass dismissals to be very real and only one in 33 stated that this danger is far-fetched. At the same time, when evaluating the possibility of similar reductions not in general, but at their own institute, only 8 percent of the respondents considered it very real, 43 percent considered it fairly real, 34 percent considered it not very real, and 4 percent considered it not real at all.

In other words, a significant—up to one-fourth—portion of the scientists are convinced that at their institute everything somehow or other will work out, "will blow over." Apparently, they are basing themselves on the quite prevalent principle that we, they say, are a completely different matter.

At the same time the threat of mass dismissals at one's own institute is perceived differently depending on the position of the respondent and the departmental affiliation of the institute. Fifty four percent of the scientific associates, 49 percent of the senior scientific associates, 45 percent of the lead (chief) scientific associates, and only 31 percent of the directors of subdivisions believe that this threat is fairly real. The threat of dismissals seems fairly real to 44 percent of the respondents at departmental institutes of union subordination, 60 percent of the respondents at departmental institutes of nonunion subordination, 30 percent of the respondents at academic natural science institutes, and 52 percent of the respondents at academic institutes of the humanities type.

Another question—on whether each respondent is personally afraid of losing his job—revealed the same, if not a greater diversity in the opinions: Yes, they are afraid—10 percent; more yes than no—19 percent; more no than yes—38 percent; no—28 percent. An astonishing thing! Against the background of the overall realization of the immediate danger for everyone, 66 percent believe that it does not apply very much to them personally.

In evaluating their own fears of being out of work, men feel more confident (more irresponsible?) than women (22 percent of the men and 40 percent of the women are afraid of being out of work). For the present it is not clear whose view of things is sober. Further, the fear of losing one's job increases with age. It, the fear, is less, the higher the position of the respondent is.

On the one hand, the increased activity of scientists (both within the institute and outside it) and, on the other, passivity, the reluctance to undertake anything, and certainty of the futility of any actions may be a consequence of the growing apprehensions.

The survey showed that far from everyone—not more than 49 percent of the respondents—are taking specific steps outside their institute, being afraid that they may be dismissed. Twenty five percent are looking for work in the private sector and business; 16 percent are putting out feelers at other scientific research institutes; 9 percent are seeking a job abroad; 9 percent are seeking at least some temporary job, believing that they will succeed in waiting out the worst times; 6 percent are preparing for a transfer to a teaching job, while 5 percent are preparing for a transfer to production (it was possible to give more than one response).

Scientists, who are trying to increase their chance of not getting the axe at their institute, are working more actively and purposefully (see Table 2).

Table 2

Responses to the question: "Are you taking any steps to increase your chance of remaining on the job?" (percent of respondents; it was possible to give more than one response)

I am trying to complete work with a high quality and on time	54
I am seeking economic contractual jobs	51
I am trying to display initiative, to advance new ideas	30
I am trying to publish more	14
I am trying not to quarrel with colleagues and to maintain friendly relations with everyone	10
I am trying to improve relations with superiors	3
I am trying to improve my position by active community work	3
I am trying to organize colleagues for joint actions against dismissals	2
I am not taking any steps	15
I find it difficult to respond	2

It is pleasing that dubious stratagems are not attracting scientists, and they are linking positively the strengthening of their position at work with the intensification of their usual activity. But, of course, not everything depends on them. Everyone has come under the threat of being dismissed—whether he realizes this or not. But how does it affect the psychological climate at the institute? And why all the same are dismissals inevitable? Is the unemployment of scientists always and in every respect a misfortune? Will the labor exchange help scientists?

About this in the following articles.

[No 40, 16 Oct 91, p 3]

[Text] **Scientists Without Work: Causes and Consequences (Second Article)**

The reflection of scientists on their own fate and the impending catastrophe, as a result of which many of

them are fated to be out of work, encompasses various aspects of the social whole, in which they pass their time. Their stand is also not without elements of repentance, therefore, the problem reduces in part to a simple dichotomy—where, they say, is the main blame: in the association of scientists or in circumstances that are external with respect to them?

There Is No Need To Bring Forth So Many Scientists in a Poor Country

Scientists are making the most serious accusations against the social structure of the country and the management of its power structures. As is clear from Table 1, this management, in the opinion of scientists, is shortsighted and incompetent. Not having during the period of general crisis any sound science policy, it is destroying in a panic, perhaps, in order to plug up the next hole, its own most expensive and necessary reserve. The situation with the introduction of scientific achievements in production practice is also no better. Administrative structures, which were unable to develop the appropriate mechanism, are again to blame for this.

Table 1

Responses to the question: "What is the main cause of the impending mass dismissal of scientists?" (percent of respondents; it was possible to give more than one response)

The shortsighted policy of the management, which is trying to economize on the intellectual resources of the country	59
The lack of interest of production in the introduction of scientific achievements	50
The poverty of the country, which cannot support so many scientists	31
The swelling of staffs, the surplus of the human potential in science	31
The economic ineffectiveness of science	24
The transition to market relations	23
The disintegration of the Union and the reluctance of the republics to finance union science	14
I find it difficult to respond	1

In the opinion of the respondents, it is also impossible to relieve of responsibility the organs of management of scientific activity, which have acquired the worst traits of the administrative command system, which gave birth to and fostered these organs. The surplus of scientists, whom the country simply cannot maintain, appeared through these efforts of theirs. However, not only the organs that manage science are to blame. Scientists themselves are good—one-fourth of the respondents see the cause of the impending unemployment in science in the low efficiency of their activity, which it is impossible to tolerate any longer.

Finally, the events of the period we are going through—the transition to a market and the disintegration of the Union, particularly the uncertainty of the status of many institutes and the sources of financing of their activity—are also affecting the fate of scientists.

As the study showed, in the next two to three years scientists do not expect anything good in the sense of financial support. In the opinion of 67 percent of the survey participants, the amount of financing of science in the country will decrease, 18 percent believe that it will remain at the former level, 6 percent believe that it will increase, and 10 percent found it difficult to respond.

But 22 percent found it difficult to respond to the same question, only as applied to their institute. Whether it is provided with budget financing to the end of the year

hardly does not interest them. Rather, there are institutes, at which the problem of participation in management is being solved very simply: It is not that they do not let associates manage, they release information piecemeal. It is not surprising that 37 percent of the respondents complain: There was no official notification at their institute, everything is confined to rumors. True, the opposite situation, when the management officially informed its associates of the financial difficulties being experienced by the institute, was noted more often—by 48 percent.

But the financial situation is as follows: For 40 percent of the institutes budget financing has been provided until the end of the year, for 38 percent it has not. Moreover, whereas with respect to academic institutes the estimates are most often close to the average level, at departmental institutes the situation is ambiguous: There assets have been provided to half of the specialized institutes, they have not been provided to two-thirds of the auxiliary institutes.

What does the management plan to undertake where financing has not been completely guaranteed or has not been guaranteed at all? Twenty five percent of the scientists admitted that they do not know, while another 10 percent found it difficult to respond. Thirty five percent of the respondents know nothing with respect to what will happen with them.

While here are the reports of those who are in the know. The management, apparently, has two routes. The first is

to seek without delay outside sources of assets. In the words of 47 percent of the respondents, their managers, who are trying to increase the amount of economic contractual work, chose it. The administration of humanities institutes of the big academy and institutes of the USSR Academy of Medical Sciences is working particularly actively in this direction. The other route is to begin by hook or by crook to force its associates from work. And the management of several institutes did not reject this route. In 32 percent of the cases it decided to carry out selective reduction, in 10 percent of the cases—to grant all associates a long leave without the retention of pay, and in 3 percent of the cases—to reduce everyone's wage. And practically no one decided to begin mass dismissal. But this is not reassuring and is not convincing the respondents. If, they say, it did not come off now, it will later. They do not cease to ponder, whom and how many people they will dismiss at their institute, if all the same it is not possible to avoid mass reductions.

Twenty six percent of the survey participants are certain: The most likely victim is elderly scientists with a long length of service and much scientific experience, who do not hold management positions. It is necessary, apparently, also to add here the 6 percent of the respondents, who simply indicated: They will dismiss retirees. At the other pole are young people. In the opinion of 17 percent of the respondents, first of all young scientists without a degree, who do not have their own theme, will get the axe.

Of course, the elderly and young people prove to be undisguised antagonists in the discussion about whom they will dismiss. According to the notions of the elderly, at first, undoubtedly, they will lay hands on them, while young people have nothing to fear. Young people share the same strong certainty, but see only themselves in the role of the persecuted.

Between the two age poles are those whom dismissal threatens to a lesser extent: middle-age scientists with a degree, who are carrying out an independent theme—2 percent, and directors of structural subdivisions—3 percent. It is interesting that in addition to the age-position criterion some people also propose another criterion. Five percent think that the reductions will be used as an excuse to settle accounts with disagreeable people—they will dismiss them earlier than anyone else.

The following scale of reductions is predicted. In the opinion of approximately 1 percent of the respondents, at their institute they will dismiss more than 50 percent of the associates. More respondents—8 percent—are inclined to think that such a lot awaits from 25 to 50 percent of the associates, 18 percent—from 10 to 25 percent of the associates, and 14 percent—from 5 to 10 percent of the associates. Seven percent of the respondents think that at their institute they will dismiss up to 5 percent of the associates. Forty six percent of the respondents did not wish to guess what portion of their colleagues will be out of work.

Morals Sustain Losses

The threat of dismissal has an extremely adverse effect on the psychological climate at the institute (see Table 2). It keeps people tense, gives rise to a feeling of despair and hopelessness, and paralyzes the will, on the one hand, and, on the other, gives rise among some people to feverish and not always worthy activity, which is motivated by the desire at any price to dig in at the institute and not to get the axe. In the unanimous opinion of the respondents, the threat of dismissal, under which scientists have come, reveals in them not the best traits and draws them into the sin of despondency, envy, and confrontation. What is more, it forces the weak in spirit to act cunningly and to temporize, to resort to actions that by no means increase the prestige of scientists.

Table 2

Responses to the question: "How is the threat of dismissal affecting the psychological climate and the behavior of people at your institute?" (percent of respondents; it was possible to give more than one response)

It is causing a feeling of hopelessness and despair among people	35
It is giving rise to isolation and distrust among people	29
It is giving rise to conflicts, squabbles, which are aimed at "scheming" against and "driving out" colleagues	19
It is leading to attempts to create for oneself additional authority in the sphere outside science (social, political activity, and others)	17
It is contributing to the unity of people and is increasing people's tolerance toward each other	10
It is leading to collective actions of associates against dismissals	4
It does not have any effect	5
I find it difficult to respond	21

Women—45 percent—sooner than men—28 percent—fall into despair. The older people are, more often, made wise by experience (or moved by bitterness?); they talk about distrust and conflicts. The atmosphere at departmental institutes is particularly tense—there the problem of isolation and squabbles has been aggravated and has acquired, judging from the responses, greater urgency than at academic institutes.

The Burden of the Search

Assume that the worst has happened, a scientific associate has been left without a job. It is necessary to seek a new one, if he did not find something beforehand. Thirty percent already have an eye on such positions, 47 percent do not. Men in this sense are a little more farsighted than women. Age also has a distinct effect: Fifty eight percent of those, who are under the age of 30, and only a fifth of the respondents, who are 50-60 years old, have a standby position.

Those, who provided themselves with a position beforehand, having had a lot of trouble in the search and not having found a job in their specialty, will probably be faced with the following dilemma: What are they to do—to move to another city in order to retain their specialty and theme, or to go to work in another specialty, but in Moscow? Forty seven percent of the men and 66 percent of the women have already made their choice. For them the value of living in Moscow is so great that they are willing to sacrifice both their theme and their specialty if only to stay. If Paris is well worth a mass, why not Moscow? The younger the respondents are and the more insignificant the held position is, the firmer their resolve is to cling to Moscow. Only 8 percent of the respondents would agree to move of their own will to another city. Thirty seven percent had not yet decided the question for themselves.

Scientists attach even less importance to what department they are to work for. "Departmental patriotism" is absolutely not characteristic of them. In the search for a new job they would direct attention to this parameter last of all (2 percent of the respondents). The main concerns for them are 1) money, the wage, and 2) the opportunity to display their initiative and abilities (54 percent and 42 percent respectively). The approach is sensible—earlier it was considered good form to keep quiet about one's material interests. Now hypocrisy has begun to diminish, and cost of living is such that money is urgently needed, therefore, the natural interest for the scientist in a general subject specialization (21 percent of the votes) and a narrow scientific theme (9 percent) is as if shifting to another register and is becoming a secondary factor, although it is not being superseded altogether.

The question of the wage is particularly urgent for young scientists (79 percent), by the age of 50-60 it loses its urgency (42 percent). The aspiration for the opportunity to display initiative is very urgent for those who hold the

position of scientific associate and senior scientific associate, the others are less anxious about this.

Given all these concerns half of the respondents are prepared for the fact that the situation may take an extremely unfavorable turn and they will not have any choice. Then they will have to agree to any job. Only 30 percent do not share such a prediction. In their opinion, it will not come to extremes.

This opinion does not change the overall painful impression that forms on becoming familiar with the hopes and fears of the surveyed scientists—certainty of the inevitability of the worst, which is accompanied both by apathy and by the willingness to play dirty tricks on others and, at the same time, by the irresponsible belief that all this will miraculously now concern me, a specific so and so, prevails among them. How little there is left in us of the seekers and sowers of the good and the eternal.

[No 41, 17-23 Oct 91, p 6]

[Text] Who Needs Unemployed Scientists?

Having weighed all the pros and cons, the Moscow scientists, who discussed the situation with employment in science and the possibilities of avoiding unemployment among scientific personnel, conclude that the diagnosis of the disease is bad, while the prediction is not very comforting. Far from everyone will succeed in retain their job, and it is not at all obvious that the dismissed people will be able to find themselves an equivalent position.

You Rely on the Exchange, While I Myself....

Apparently, the bulk of the scientists, who have gotten the axe, in general will have to bid farewell to science. At best they will be able to find a job, which requires a higher education, but does not involve scientific activity. Sixty two percent of the respondents share such a supposition. Only 6 percent are not losing hope, believing that scientific associates, who have proven to be the best at their institutes, still have a chance to find an equivalent job in their specialty and specialization. Another 6 percent think that this will be a scientific job, but in another specialization. Finally, 11 percent hold an extremely pessimistic view, according to which nothing awaits dismissed scientists, except an unskilled job, or else simply physical labor.

Pardon me, people may object, but there is employment legislation, there is the labor exchange, there is, finally, the set of measures that are called upon to defend the interests of the unemployed, including scientists who have been left beyond the doorstep of their institutes. Yes, there are, but scientific personnel have a skeptical attitude toward them, they do not believe in the effectiveness of laws, exchanges, and measures and do not expect help from them, should anything happen. And that is why they know about them in most general terms, by hearsay, without having even the desire for reliable information on the essence of the problem, although at any moment it may assume exceptional urgency for literally each person.

Thus, 14 percent of the respondents were not able to answer at all the question, whether in case of dismissal any relief is due to a scientific associate on the part of the institute, at which he worked. While of those who did respond the majority are mistaken when speaking about the amount of this severance pay. Seven percent of the respondents name one month's salary, 17 percent name two months' salary, 27 percent name three months' salary, and 34 percent name more than three months' salary. Scientists 50-60 years old, directors of subdivisions, and people working in the position of "scientific associate" show a little greater knowledge than the others.

Hardly any of the respondents doubts that unemployment benefits are due to scientists, who have lost their job, but 15 percent do not know whether for this it is necessary to acquire officially the status of an unemployed person, in particular, whether it is necessary to register oneself at a labor exchange. Even more—37 percent—do not have an idea of where an unemployed scientist will receive his benefits. Seventeen percent mention in this connection the former place of employment, 7 percent mention the rayon department of social security, 36 percent mention the labor exchange, and 3 percent mention other organizations. There are fewer mistakes in the responses in this regard, the older the scientists are and/or the higher the positions they hold.

Approximately one respondent in five is unable to say anything about how long a dismissed scientist will be able to receive unemployment benefits and what their amount is. It is necessary, true, to note that at the beginning of June, when the interviewing was conducted, this issue had not yet been settled completely. However, in the press it was quite officially reported (see, for example, the weekly of the Federation of Russian Independent Trade Unions, PROLOG, 6-12 June 1991) that

"people are guaranteed the payment of unemployment benefits for 12 months in the amount of the average wage." Knowing this, it is easier to evaluate how correct scientists are in their assumptions. And they are like this. The amount of the benefits will be equal to: the salary at the last place of employment—22 percent of the respondents; half of the salary—7 percent; a sum that corresponds to the official subsistence wage—35 percent. An unemployed scientist will be able to receive benefits: until he finds a job—33 percent of the respondents; no longer than a year and a half—15 percent; no longer than a year—15 percent; half a year—13 percent; three months—5 percent.

As is evident, scientists are very poorly informed about the legal status of an unemployed person. There are several reasons for this. Objectively: It was repeatedly discussed and revised, it was easy to get confused. The mass media reported on it sparingly and as if reluctantly. Subjectively: Worried about their own future, scientists hope that fate will spare each of them personally and they will not have to go without work. Why, in such a case, rack one's brains and go into the details of employment laws, when they will not be required?

Further: Scientists simply cannot believe that someone would want and would be able to throw a drowning figure of science a life ring in the form of a suitable job. It is not in the rules of our state to help its citizens get out of trouble. As for the labor exchanges, they will probably deal with the problems of the job placement of not so highly skilled specialists. They will not be able to help scientists (see Table 1), while for the present we are not hearing about specialized exchanges. And do they care about exchanges now, when the opportunity has appeared to think about actually going abroad, having forgotten about arguments like "I already wanted to go to Paris"?

Table 1

Responses to the question: "Do you think that the hope that the labor exchange will be able to find a scientist a job, which corresponds to his skill and experience, is great?" (percent of respondents)

The hope for this is great	3
The hope for this is little	62
There is no hope for this	27
I find it difficult to respond	8

Everyone Will Not Leave

The notion that dismissed scientists, who have not found an equivalent job, will try like one man to go abroad, is incorrect. If we judge from the results of the survey, 32 percent of the men and 44 percent of the women do not intend at all to go anywhere. They are firmly prepared to stay here, no matter what happens. There are more people who would like to leave, but under a temporary contract, in order to return upon its expiration—53 percent of the men and 49 percent of the women.

The fact that far from everyone regards emigration as an acceptable route for himself shows, apparently, both the

insufficient understanding of the depth of the crisis, in which the country has found itself, and traditional Russian inertia. But also love for the homeland, a belief in its better future, and the hope at least somehow to contribute to its finding of inner peace. Yes, the same feelings which pert internationalists have already become accustomed to consider an attribute and stamp of dust pan chauvinism. Meanwhile the leaders of the Moscow alternative economy also do not intend to leave with aims for the West. Of course, their reasons are based on calculation—46 percent of the directors of cooperatives, joint ventures, and small enterprises, who

were surveyed by us in a recent study, are certain that now it is better to engage in business here than abroad. However, 59 percent of them categorically do not agree with the idea that in this country there is nothing to hope for and, therefore, sooner or later it will be necessary to leave. Thus, both businessmen from Moscow and Moscow scientists know belief and hope.

Among the latter the desire to leave for a while is particularly intense among those who are 30-39 years old—64 percent of the respondents from this age group admit this; among senior scientific associates—58 percent, among candidates of sciences—60 percent, as well as among those who work at humanities institutes of the USSR Academy of Sciences—68 percent, at institutes of the All-Union Academy of Agricultural Sciences imeni V. I. Lenin—67 percent, and at institutes of the USSR Academy of Medical Sciences—60 percent.

It is a stone's throw from how scientists settle this question for themselves: to leave or to stay, to the problem of the "brain drain." It is well known that

people interpret it in different ways. For some it has not lost its ideological meaning, owing to which the migration of scientists across the border to other countries is viewed exclusively in terms of the harm which is done in this case to the scientific potential and might of the country being left.

In the opinion of others, the problem as if does not exist, rather, this is the business of those who stay. For those who go this is an opportunity to realize their right to the freedom of choice.

No particular argument over how to treat the departure of scientists arose among the respondents (see Table 2). And what is there to argue about? None of the respondents doubts that: 1) this is economic nonsense—to appeal to the patriotic feelings of a scientist, to maltreat him, and to keep him on starvation rations; 2) this is immoral—to prohibit a scientist to work where he considers it appropriate for himself. It is possible to discuss only the causes and consequences of the simultaneous departure of many scientists.

Table 2

Responses to the question: "They say that in connection with the passage of the law on entry and departure, as well as on account of unemployment among scientists the 'brain drain' process will intensify. With which of the statements cited below in this regard would you sooner agree?" (percent of respondents; it was possible to give more than one response)

The emigration of scientists is a reflection of the disastrous state of science in the country, where the state does not value the intellectual potential of the nation	79
The movement of scientists from one country to another is a normal process of the civilized world, which leads to the mutual enrichment of cultures	48
When they have opened the borders, the best scientists of the country will leave, you cannot do anything about it	18
First of all scientists, who live mainly for material interests, will emigrate—our science will suffer little from this	9
I find it difficult to respond	1

For the majority of scientists who participated in the survey the emigration of colleagues is no cause to shed tears (oh, they say, the best scientists of the country will leave) and not grounds to fling mud at those who are leaving (those who have only material interests, they say, are going). The mass departure of scientists is an invective against the authorities and a consequence of their unreasonable policy. The respondents do not see anything fundamentally disgraceful, bad, or harmful in the moves of scientists from one country to another, regarding this as a completely normal procedure, especially when the threat of unemployment looms not far away.

This alone is not driving scientists from the country. In talking about the causes of potential departures, the respondents also cited the poverty, in which they are tired of living—26 percent, the fear of the further intensification of the crisis in the country—24 percent, worry about the future of their children—22 percent, fears for their own life and for the life of their relatives—9 percent. This is what is pushing scientists from here.

And here is what is attracting them there: a more free, full-value life—22 percent, the chance to show more completely their worth—6 percent, and the opportunity to live as they wish—6 percent of the respondents. As is evident, the reasons for the emigration of scientists go beyond the purely economic sphere. Noneconomic considerations are of particular importance for women, junior (in the sense of age and position) associates, and humanities scholars. It is interesting that among the reasons for his hypothetical departure no one named the desire to go to his ethnic homeland, the desire to be reunited with relatives, and so on. Apparently, such people have already left, but, perhaps, reasons of this sort arise later, closer to the point, when it is necessary to give "plausible" grounds for one's intention to leave forever the hateful homeland.

But this is by the way. The main thing lies in something else. In the fact that given the most loyal attitude of scientists toward the very fact of emigration and their considerable resentment of the policy of the authorities, given the complete despair and certainty that no one will

help the unemployed scientist with finding a job, thus, given all this the aim of leaving without returning was recorded among only 6 percent of the respondents. One would like to know: If they do not want to go, understand that the chance to keep their job is not great, but do not hope to find a new, equivalent job, what is the solution? What are already dismissed scientists, those, for whom this is in store, and the entire scientific community to do?

The solution of the problem of financing science, with which the threat of the unemployment of scientists is so closely connected, in recent days, thank God, has gotten moving. According to a press report, academic, departmental, and VUZ science have found themselves a new sponsor in the person of Russia. However one must not forget that under our conditions in the end only the science, which ventures the elimination of state control, will be able to save itself and its personnel. Let us wish it success.

Computer Enterprises Struggle With Collapse of Computerization Program

927A0080A Moscow RADIKAL in Russian
No 44, 13 Nov 91 pp 2, 3

[Article by Leonid Zavarskiy: "The Informatization of the Entire Country"—first paragraph is RADIKAL introduction]

[Text] The Presence of Absence

Ever since all the recent union computerization programs, starting with the computerization of the school, died quietly, they have preferred not to disturb the dead. They have preferred all the more to say nothing about the spent money—although the ruble is becoming cheaper day after day, in the amount thrown to the wind there were all the same too many zeros. Now they have suddenly remembered the expenditures and the deceased and have begun to talk about computerization programs, but now of Russia, the Ukraine, and several other sovereign states. What is this—the desire to go over the ingloriously covered ground again with a different result or a new (that is, the long-forgotten old) policy under the new conditions? Several October exhibitions help to clarify the situation.

Conversion Also Wants To Live

From 21 October to 23 November conversion is letting itself be heard from at the Metallurgy Pavilion at the Exhibition of National Economic Achievements. No one, it is true, intends to convert tanks into truck tractors or to reforge them into office paper clips. A small enterprise, the Konvertor Commercial Demonstration Center, together with leading developers and producers of computer hardware, whose military past and present are evident not only from their posture, as well as enterprises of the Ministry of the Radio Industry are holding an exhibition and trade fair of educational computer packages (KVUT). USSR Deputy Minister of the Radio Industry E. Fil'tsev, when commenting on the tasks and goals of the exhibition, acknowledged that in its present form the department is discontinuing its existence and is being transferred to other, mainly republic, structures. Owing to the fact that the sector's enterprises are spread throughout the country, they are becoming the property of the sovereign republics, but should continue to operate, while coordinating their actions. The production of educational computer packages, each of which is a locally distributed network that is suitable for use as an educational classroom at schools, *tekhnikums*, and vocational and technical schools, while at enterprises they can solve problems of the complete automation of accounting and financial, economic planning, technological standard, and other services, may become an important uniting factor.

V. Kruglov, the director of Konvertor, believes that it is possible to revive the program of universal computer literacy, moreover, this is necessary not only so that the sector, which produces domestic personal computers,

can rescue itself, but also for the school. In his words, as a result of the shortage of assets the computerization of schools has actually been halted. Schools need about 3 million personal computers.

The task of the sector is to bring the consumer properties of school computer hardware as close as possible to the world level by using the potential of the defense industry. In combination with low prices this will make it possible, on the one hand, to provide educational institutions with computer hardware and, on the other, to win the competition with foreign personal computers for its own market. Konvertor is offering computer classrooms in buses to rural schools, which due to the shortage of assets have been deprived of the opportunity to buy computers. One such classroom on wheels is entirely capable of replacing several permanent computer lecture halls.

The biggest problem is that educational computer packages are produced by enterprises of a number of ministries. The lack of a common standard had the result that personal computers are hardware- and software-incompatible, while this entails large expenditures on the development of applications software and maintenance. Meanwhile a document entitled "The Concept of the Development of Educational Computer Packages for 1991-1995," which, of course, should have appeared about six years ago, was prepared in the depths of the Ministry of the Radio Industry and the USSR State Committee for Public Education. Better late than never?

Will Sellers Become Buyers?

If the manufacturers of computer hardware have a cold, the developers of information technologies inevitably also get sick. In spite of being unwell (domestic software does not have a stable market even at home), they decided to hold the SOFTUL-91 international exhibition and trade fair from 29 October to 2 November at the Exhibition of National Economic Achievements. The chaos on the software market and the lack of even the most elementary marketing leave a single opportunity to take a look at others and to prove one's worth—the holding of annual exhibitions and trade fairs. The idea itself is rather good—software makers get together on a limited area and visit each other. Consumers, acting as guests of the guests, will familiarize themselves with the commodity and will buy something more for their own needs. It only remained to find a good excuse, and it is possible to organize the exhibition.

The presentation of the Informatization Program of Russia was the main theme of SOFTUL-91. The author of the program, the Russian Scientific Research Institute of Information Technologies and Computer-Aided Design Systems, regards as its basic directions: regional informatization, the development of standard informatization designs (banking, exchange, office, and other systems), the development of new information technologies, information networks, and telecommunications, hardware and software standardization, the informatization of the social sphere, as well as state and republic

organs of Russia, and, finally, the development of computer-aided design systems in science, technology, and production. The implementation of the program, in the opinion of the authors, will create an information infrastructure, which will contribute to the development of market relations.

Thus, the answers have been given. But how about the questions? Market advocates, for example, believe that first of all not informatization, but new laws: on the freedom of trade, on exchanges, for combating monopolism, are needed. Where are they? And at whose expense will the informatization program be implemented? Will it not repeat the sad fate of its predecessors, being undertaken as a demonstration of the vastness of the plans of the new Russian structure? Finally, who are the buyers of software? In Interkvardo, for example, the department, which previously filled orders for software of the computer systems of city, oblast, and rayon committees, was just eliminated. Potential buyers are more worried today about problems of survival under the conditions of the economic crisis, while they are calling exhibitions like SOFTUL-91 a feast during privatization.

Incidentally, there are buyers of new information technology. They are, for example, the manufacturers themselves. New programs are needed for the production of new software. Those who came to the exhibition to sell may become buyers. But what about the others?

They Were, They Are Taking Place, They Are Participating

On the initiative of the Delovoy mir Consortium the first conference of domestic distributors of computer and electronic equipment of Seiko Epson Corporation was held on 31 October and 1 November in Moscow. Those who gathered noted that the formed situation does not generate particular enthusiasm. Small dealers are doomed, while there are no dealer systems in the country. Standards for imported and domestic computers are also lacking, there are no validation and certification of them. The utilization ratio of computers is extremely low, there is no service and software support. L. Vaynberg, chairman of the Science-Industry Union, criticized the continuing practice of the groundless state informatization of the country, having said that informatization should develop as the product of the

natural commercial development of the computer and software market, and not as the senseless and futile spending of state assets.

State tax policy remains a fundamental problem. Software and computers, which are brought into the country, are taxed on five occasions—the duty, the import tax, the turnover tax, the sales tax, and the profit tax. In many regions a 25-percent tax on sales has also been introduced. This makes the sale of computers unprofitable or a criminally punishable business. Only the shadow structures, which, by not paying taxes, can maintain relatively low prices for their commodity and bring it down for those people, who are subject to state tax aggression and are forced to overstate the sale value, are prospering.

It was noted that instead of plans of global informatization it would be worthwhile for manufacturing enterprises to think about the production if only of the simplest components for the purpose of their export. The 10 plants of the IBM Corporation in Europe obtain 65 percent of their raw materials from our country. In the opinion of distributors, the practice of selling resources for next to nothing should be qualified as criminal.

The representative of the State Committee for Standards rejected the claims against his organization. His arguments seemed extremely original: What is absent in reality exists, but thus far has not been made, therefore, it is impossible to talk about an absence.

The conference participants announced the establishment of the Association of Distributing Firms of Computers and Electronic Equipment as an international nongovernmental nonprofit organization of the open type with registration in the RSFSR. Participation in the association should protect against the negative consequences of state tax, customs, financial, and certification policy. The association drew up a list of recommendations in the area of the formulation of state computerization policy, which reduced to preferences for computer enterprises and firms.

If we try to summarize the two exhibitions and one conference, we will, apparently, have to arrive at the formula of Polesov, the single artisan with a motor from *Dvenadtsat stulyev* (*The Twelve Chairs*). He, as is known, stressed the presence of absence. However, the mechanic-intellectual lacked three-eighth-inch dies. In our case there is the presence of the absence of agreement.

New International Moscow Exchange To Sell Intellectual Property

927A0092B Moscow IZVESTIYA (Union edition)
in Russian 28 Dec 91 p 3

[Article by S. Leskov: "Scientists Also Have Their Own Exchange"—first paragraph is IZVESTIYA introduction]

[Text] The opening of the Dom uchenykh International Intellectual Property Exchange has been announced in Moscow.

It is no secret that the problem of introducing scientific and technical achievements, in spite of heaps of decrees, has never been solved. As a result many scientific institutions with the most abundant potential have found themselves today on the verge of bankruptcy. The problem of introduction requires a fundamentally different, market approach. The establishment of the intellectual property exchange is also such an attempt.

Among the founders of the new exchange are the Academy of Sciences, the Academy of Medical Sciences, the Engineering Academy, and the Academy of Economic Sciences and Enterprise. A huge scientific potential, which now is a dead, unclaimed load, has been built up in the subdivisions of these academies. As Prof. V. Lisichkin, president of Dom uchenykh, said, an understanding has been reached with the structures, which represent the interests of the military-industrial complex and the national economic complex, which as the consumer of the intellectual product will have close contact with the exchange. Not only the large scientific research institute, but also the individual scientist can offer their product on the exchange. Each proposal will be evaluated by a group of international experts with great authority.

The first bidding may take place already by the end of the year. Prof. V. Lisichkin cited examples of products, which the experts intend to offer for bidding: a 23-language dictionary of economic terms of all the former union republics, an ecologically clean and highly productive agricultural technology of potato cultivation, new medical instruments, drugs, operating technologies. And although the exchange has not yet officially begun its activity, two broker's seats have already been sold—for 4 million and 10 million rubles.

It must be admitted that western stockbrokers consider the intellectual property exchange an unthinkable undertaking. An analog of such an exchange does not exist anywhere in the world. The apprehensions are all the more valid since in our country, in essence, there is no legislation on the protection of intellectual property. Is it possible to make legally formalized deals for a product, which belongs to it is not clear whom? However, the directors of the exchange are full of optimism: The acute need for scientific and technical developments will eliminate all the contradictions.

Effect of Foreign Trade Laws on S&T Research

927A0091A Moscow MOSCOW NEWS in English
No 49, 8-15 Dec 91 p 11

[Article by Leonard Nikishin: "Scientists in Doubt"]

[Text] Speaking in real terms, this country has only two exportable commodities: raw materials, and scientific developments. Today science in this country is experiencing a "moment of truth": old structures of "science ministries" are crumbling, and independent teams of scientists are gathering strength and receiving increasingly more R&D contracts from abroad. How is the presidential decree On Liberalization of Foreign Trade going to effect scientific research? MN's Leonard Nikishin put the question to Alexander Buloshnikov, manager of the Geos-A cooperative concerned with seismic zoning and calculating seismic risk for their clients.

Says Alexander Buloshnikov:

"In this country we must now decide whether we will allow the continuation of 'brain drain' or start exporting intellectual property. The old legislation encouraged the former. Companies, universities and other organizations from abroad are prepared to grant subsidies to Soviet scientists, but there's no way for Soviet scientists to use the subsidies in this country. The only path is for the scientists to go abroad and do the work there. However, it is more logical and profitable for the country to have the work done here, entailing hard currency payment for the use of the domestic scientific and production facilities and to the people involved in the projects, not to mention the hard currency taxes for the state.

Scientists using the grants must be guaranteed that the state will not claim a disproportionate amount of the money and that the money can be kept in any of the world's banks (scientists would most likely opt for depositing the money in a Soviet bank, because of the convenience). The scientists must also have the right to choose what equipment will be purchased with the money. In other words, they must be put in charge of the grants.

Regretfully, the new decree allows exceedingly broad interpretation, which could be abused by the creators of the specific acts. I'm afraid, the interests of the producers of intellectual property will be ignored. And in practice, the barriers erected will be bypassed, because we know how to, with seven decades of experience. Soviet scientists continue to receive Western grants which remain in the West and bring no profit into this country. At home, R&D work is paid for in roubles.

No matter how strict hard currency regulation is, it cannot prevent the opening of a sister company in Hong Kong or Singapore or a similarly economically propitious place. The company covers the Soviet scientists' research expenses and pays moderate taxes to the country where it is registered. But the Soviet state gets nothing.

Incidentally, this is one of the main reasons why this country's banks have only 5 billion dollars in deposits (while at least 10 billion are estimated to circulate on the black market). The majority of the hard currency possessed by Soviets is deposited in foreign banks. The country's hard currency policy-makers seem unaware of that fact, if they think that granting permission to keep money in Western banks would drain the country of hard currency. In fact, this has already happened.

French Delegations Negotiated Hi-Tech Projects

927A0092A Moscow *RADIKAL* in Russian
No 45, 20 Nov 91 p 1

[Article under the rubric "A Fact for *RADIKAL*": "In the USSR Science-Industry Union"]

[Text] This week (19-24 November of this year) the most representative delegation of business circles of France during the years of Soviet power headed by Francois Perigo, president of Patronat Francais (the Council of Employers), came to Moscow and St. Petersburg on the invitation of the Science-Industry Union.

The goal of the French businessmen is to continue the talks with their Soviet colleagues on an entire set of economic projects in the area of the aerospace, aviation, machine building, light, and food industries, information science, electronics, and communications.

In particular, the development of modern telecommunications systems, a multipurpose civilian helicopter, and a 50-seat passenger airplane has been planned jointly with French firms. The French will also cooperate with enterprises of Omsk in the production of modern washing machines and enterprises of Petersburg in the development of a new television. Today leading firms of France have set to work on the project of the modernization of the water supply of the city on the Neva.

All the aspects of Soviet-French cooperation are being carried out under the aegis of the Science-Industry Union and Patronat Francais. Today the Science-Industry Union is also developing similar business contacts with entrepreneurial structures of Italy, Germany, Japan, the United States, and other developed countries.

The participation of the Science-Industry Union in the establishment of business ties is aiding not only the stabilization and development of individual specific enterprises, but also the economy as a whole, since a skilled approach to the implementation of international economic ties is a guarantee of the success of the partners.

Cocom Interference in Trans-Russian Digital Optical Link Criticized

927A0056A Moscow *DELOVOY MIR* in Russian
29 Oct 91 p 2

[Article by Nikolay Suglobov: "Cocom: A Ring of Communications or a Ring of Bans?"—first paragraph is *DELOVOY MIR* introduction]

[Text] It is unquestionable that the integration of the USSR in the structure of the world economy is problematic without the assurance of the exchange of scientific, technical, and economic information. With allowance made for this the USSR Ministry of Communications in 1988 came forth with the initiative to lay through the territory of the country an advanced digital trans-Soviet link (TSL), which would connect the countries of Europe with the states of the Pacific region, Southeast Asia, and Oceania. It was planned that to the west of Moscow the TSL would have two routes: the northern route—through Leningrad to Denmark and the Scandinavian countries, and then to Great Britain; and the southern route—through Kharkov and Sevastopol to Italy and other countries of the coastal area of the Mediterranean Sea. To the east of Moscow it was proposed to lay the TSL through Nakhodka to Japan. The TSL would close the global ring of communications, which passes through three continents and three oceans, and would make it possible to boost the capacity of the World Communications Network, having increased its reliability and the quality of transmitted information.

Western firms displayed enormous interest in the project. USWest (the United States), KDD (Japan), STET (Italy), British Telecom (Great Britain), Bundespost Telekom (the FRG), OTS (Australia), and Telekom (Denmark) signed a protocol on participation in a feasibility study of the TSL. Soon the Corporation for the Development of the TSL, of which in addition to the listed firms concerns of Spain and South Korea also became a part, was established.

To start the construction of the TSL this year with the prospect of its completion by 1994 it is necessary to obtain an export license for the necessary equipment. It is here that the difficulties began. The U.S. Department of Commerce and Cocom did not grant a permit for deliveries to the USSR of the equipment that would ensure the transmission of information at a rate of 565 megabit per second. The U.S. Administration and the Government of Great Britain upheld the ban, linking it mainly with political grounds and expecting that the bans would create a new threshold of the lag of the USSR in the organization and technology of communications systems.

First of all the United States, Great Britain, Canada, and Australia hold a negative, rigid position in Cocom with respect to the export for the TSL of fiber optic cable and high-speed communications equipment. By the decision of the regular session of Cocom in May of this year in Paris the list of goods banned for export to the USSR, it

would seem, was cut in half, but the point is that obsolete technologies, which for a long time now have not been used in American industry, were removed from the Cocom list. Fiber optic cable as before is on the banned list.

The business world of the West greeted the recent Cocom decisions with disappointment and even concern, particularly American businessmen. U.S. industry was placed in an obviously losing position as compared with West European and Japanese competitors. This is explained first of all by the existing strict control of deliveries of supercomputers and telecommunications equipment, that is, by the bans precisely in the areas, in which the Americans hold leading positions. Other western companies, which produce similar equipment on the basis of less science-intensive technologies, are finding themselves, thus, in an advantageous position on the level of the development of trade and economic ties with the Soviet Union and the countries of Eastern Europe.

The retention of the obsolete Cocom bans is of a pronounced political nature and is aimed both at the increase of the technological lag of the USSR in the development of advanced communications systems and against the West European countries. Indeed, it is hardly possible to talk in earnest about a new European economic space, in which the USSR would participate without the proper infrastructure, which includes telecommunications and data transmission facilities.

Meanwhile the construction of the TSL affords unprecedented opportunities for the laying of the foundation of

a policy of partnership and trust, a unified world communications system. The information flows between the USSR and other countries of the world, undoubtedly, will have a positive effect on the development of friendly and open interstate relations. It is natural that the creation of a modern communications infrastructure in the USSR meets our interests, but to no less a degree than the interests of the West. It is a matter, in particular, of a base of the information support of partnership within the European Energy Charter project, when western investments in the Soviet petroleum and gas industry will increase.

The joint operation of the TSL could serve as a precedent of international control of the use of dual technologies and embargoed goods on USSR territory, not to mention the opportunity for western firms not only to get themselves good publicity, but also to earn a decent amount of money. For the United States the implementation of the project would mean the increase of its political and economic prestige, moreover, with the minimum risk, inasmuch as West European state-owned corporations are taking upon themselves the financing of the construction of the TSL. The arguments advanced against such an approach, for example, the concern that American intelligence services could eavesdrop from spy satellites on conversations, which are conducted over fiber optic communications links, lack common sense.

And still, as is known, there are no hopeless situations. The West European firms, which are interested in the construction of the TSL, have by no means been discouraged by the obstinacy of the U.S. Administration, they are persistently seeking other means of implementing the project. It seems that the results of this search will completely compensate for their efforts.

Formation of Ukrainian Academy of Technological Sciences Discussed

927A0070A Kiev *RABOCHAYA GAZETA* in Russian
23 Oct 91 p 3

[Interview with Vasiliy Stepanovich Krivulko, academician of the Academy of Technological Sciences of the Ukraine and vice president of the Academy of Technological Sciences of the Ukraine, by *RABOCHAYA GAZETA* correspondent A. Nadbereznyy; date and place not given: "Help the Talented Person Get Through"—first paragraph is *RABOCHAYA GAZETA* introduction]

[Text] In July of this year at the constituent assembly of scientists and scientific and technical personnel of the republic the Academy of Technological Sciences of the Ukraine (ATNU) was established. To what is its appearance due? What lies behind the "high-sounding" signboard? Our correspondent talks about this with Academician of the Academy of Technological Sciences of the Ukraine V.S. Krivulko, vice president of the new organization.

[Nadbereznyy] Vasiliy Stepanovich, what prompted you and your colleagues to establish the Academy of Technological Sciences?

[Krivulko] The gradual transition to market relations forced not only politicians, but also many scientists and specialists, who are involved with production, to ponder over the question: What means is it necessary to choose in order to bring the economy of our republic in shortest time out of the state and position, in which it found itself? Alas, until this moment we had not pondered in earnest over the development of domestic technological science. But the level of technology in the final analysis determines the level of development of the state. Any scientific research acquires meaning only when it is embodied in new technology and begins to be of specific benefit to society. Earlier, when working on interesting and even unique projects, individual scientists and creative collectives were not completely certain of their practical implementation. Unjustifiedly massive management structures, which stand between science and production, often hindered the introduction of these developments. Therefore, the goal of our organization is to help people produce and introduce as quickly as possible any innovation that is capable of providing a significant economic impact.

[Nadbereznyy] The activity of the long existing republic Academy of Sciences, at any rate Academician B. Paton always pursued such a policy, is also confined to the end product. Will your organization not become a kind of parallel structure that simply duplicates its work?

[Krivulko] The Academy of Sciences of the Ukraine actually has good practical experience in the establishment of pilot works and the introduction of its own developments. However, its basic task is the conducting of basic research and the development of theory. We will

promote the identification of the latest technologies, which have already been developed and have been put to use at several enterprises of the republic, and will strive for their greatest possible dissemination. And today, believe me, there are many such technologies. Our goal is to conduct a kind of registration of all the existing technological developments, which the republic Academy of Sciences is not doing and never did.

[Nadbereznyy] The Academy of Sciences of the Ukraine, which took a most direct part in the establishment of your organization, at times is justly accused of conservatism, bureaucracy, and other sins. Will it not so happen that the "diseases" of the "parent" will be transmitted to its "child"?

[Krivulko] The republic Academy of Sciences, you will agree, is a very large organization. And it is probably unfair to note in its work only shortcomings, which, by the way, are characteristic to one degree or another of any subdivision of such a scale. It would be foolish, I think, "to reinvent the bicycle," rejecting completely the borrowing of the positive experience that it has gained. As for the inheriting of shortcomings, such a thing, in my opinion, has been excluded. After all, the Academy of Technological Sciences is a public organization. It unites prominent production engineering scientists and leading specialists of sectors of the national economy on exclusively voluntary principles. For participation in the work of the academy its members not only do not receive a wage, but also pay dues themselves. To some degree this eliminates the appearance of superfluous structures, which interfere with work and would derive material advantage for their inactivity.

[Nadbereznyy] It is no secret that until now our republic bought the majority of latest technologies abroad. This "gratification" is by no means cheap. What do you think, could we in the future, by having a successfully operating Academy of Technological Sciences of the Ukraine, completely give up similar expensive purchases?

[Krivulko] Recently our organization became a full member of the International Technological Academy. But it would be unreasonable to expect that in the development of the latest technologies, which the economy of our republic needs so much, we will be able to achieve everything independently. Such membership expands our possibilities considerably. Now at many scientific organizations of the Ukraine and at enterprises, particularly of the defense industry, there are quite a few most interesting technologies. Several such enterprises are also cofounders of our academy. Of course, their unique potential must first of all be used for the development of our economy. But, I think, in the foreseeable future the sale of such innovations abroad is possible and even necessary. In turn, by selling to the West developments that are in demand, we will be able to purchase the technologies we need. Such mutually advantageous exchange will be of incomparably greater benefit to our republic.

[Nadberezhnyy] Many talented scientists are leaving our republic. One of the main causes of the drain of "brains" is the maximum possibility and profitability of realizing one's ideas "there" and the lack of such possibilities here. What do you think, can the activity of the Academy of Technological Sciences of the Ukraine influence such an outflow?

[Krivulko] The difficulties in the realization of one's own developments on the territory of the republic are merely one of the factors that are forcing talented scientists to leave the homeland. It is difficult to judge precisely to what extent it is decisive. Of course, no one will restrain by force a person who has firmly made up his mind to leave. However, taking advantage of the opportunity, through your newspaper we are appealing to talented people.

The doors of our organization are always open to them. We are not only interested in receiving and listening to everyone who wishes, but are also prepared to give financial and production assistance for the introduction of the most interesting, promising technologies. In spite of the fact that the academy has existed only a little more than two months, many people have already appealed to us. People are coming with their ideas and finished developments, with which earlier they were not able to get through anywhere. The decision on the establishment of a special 20,000-ruble prize for the best development, which will make it possible to obtain the maximum economic impact, was made at the last meeting of the presidium. We also intend to establish special stipends for undergraduates and graduate students of technical higher educational institutions.

[Nadberezhnyy] However, at first you yourselves need considerable financial support.

[Krivulko] Alas, we do not have sponsors. So we will have to count only on our own forces. Seventeen large organizations took part in the founding of the academy. Depending on their financial resources they all contributed money to the authorized capital stock, which is also our starting capital. In addition to this, we are receiving money in the form of dues from the enterprises of the republic, which have become collective members of the academy. A large part of the authorized capital stock will be used for the introduction of the technologies that we have already had time to examine.

While after deriving a profit, we will be able to set up on the basis of the cofounders and collective members small enterprises in order with their help to sell over and over again the latest technologies. We expect that in precisely this way enterprises will become the basis of the production operations of the Academy of Technological Sciences of the Ukraine. Incidentally, the question of setting up the first such small enterprise on the basis of one of our cofounders—the Kiev Arsenal Production Association—was recently considered.

[Nadberezhnyy] You mentioned the technologies that have already been examined by the academy. Tell us briefly what they are.

[Krivulko] It is well known that the production of the majority of medicinal preparations in the republic is now at a primitive, extremely unsatisfactory level. Therefore, one of the first technologies examined by us concerned pharmacology. This is an interesting technology for the production of preparations that remove radionuclides from the body. Developments regarding the production of special equipment for the performance of complicated surgical operations were examined. These are just two examples. In all work on the introduction of the latest technologies is being performed in 20 sections for directions that are vitally important for the present economy of the republic. Not simply specialists, who have an excellent knowledge of their direction, are in charge of them. The majority of them are managers of the largest enterprises. We hope that this will help to link up science and production.

Independence Creates Money Problems for Baltic Research Institutes

927A0051A Moscow *RADIKAL* in Russian
No 39, 9 Oct 91 p 2

[Article by Petr Deynichenko: "Large-Scale Science in a Small Country"—first paragraph is *RADIKAL* introduction]

[Text] During the days, when they admitted the Baltic countries to the United Nations, when embassies of foreign states were opened in their capitals, in Riga there was no euphoria. There was anxiety—will the price not turn out to be too high?

For the present, as the leader of the television program "Vesti" noted, "the Baltic region is enduring the complex of former Soviet life." This "former nature" is being felt in everything: from booths put together anyhow at potato gardens and empty stores to the building of the Latvian Academy of Sciences, which is ridiculous in its pomposity. Built in the best traditions of the Stalin era, with many extravagances and the indispensable spire, it towers among the small two-story houses with peeling paint of old Riga—not the one that they show tourists, but the one that has remained nearly unchanged since the beginning of the century: cobblestone streets, trolleys, laundry and wood sheds in the yards.... Except that instead of a kerosene store there is a center for the exchange of gas cylinders.

It was probably called upon to be the personification of the invincible might of Soviet science—the very science that independent Latvia now has to digest. It will not be that easy to do this: During all the postwar decades the scientific complex of Latvia was built first of all on the basis of the needs of the center.

The fate of union property had not yet been determined, but it is already obvious that the already existing disproportions in the structure of Latvian science, in which the chemical-biological complex clearly dominates, will to a significant degree influence its future. No upheavals are frightening to such giants as the Institute of Organic Synthesis, which has two plans for the production of drugs and is successfully selling abroad finished items and technologies, but the republic will not be able to support unprofitable scientific institutions for a long time. They will also not be able to count in the future on the replenishment of finances from the union budget—all of us, the inhabitants of the former Soviet Union, now cannot afford large-scale science.

From the second floor of the building of the Academy of Sciences of Latvia, from the office of its president, Janis Lielpeteris, the future problems of Latvian science can be seen well. If one were to raise in earnest the question of what to finance: municipal services of Riga—and to date, a significant part of the capital of Latvia lives with stove heating and bottled gas—or basic research, the matter would hardly be decided in favor of basic research.

Having a presentiment of this, Latvian scientists back in 1988 decided that it is necessary somehow to save the situation. The solution seemed simple—to eliminate the division of science into academic, sectorial, and VUZ science, which is convenient only for bureaucrats, and to entrust the care of science to scientists themselves. The Latvian Science Council was established for this. (The statute on it was approved by the republic Council of Ministers on 3 July 1990.)

The idea of the council is simple: All scientists of Latvia (doctors and candidates) elect 13 expert commissions for fields of science, then one person each from these commissions is elected to the council, the councils of leading scientific centers elect 11 people, while another four people are included on it based on their position: the chairman of the republic Council of Ministers, the president of the Latvian Academy of Sciences, and the secretary of the board of the Union of Scientists of Latvia. The council prepares a draft of the section "science" of the republic budget—here its decisions are of a recommendatory nature—as well as distributes assets for scientific research within the framework of the already approved budget. Moreover, the examination of projects, the evaluation of the effectiveness of the scientific results and activity of scientific institutions, and the determination of promising directions of research, which is being conducted at the expense of the state budget, are included in its functions.

On paper everything looks good.

However, the discussions on the organization of Latvian science are continuing to this day. Thus far a law on science has not been passed, moreover, far from everyone agrees that such a law is needed at all. Many people believe that the quickest passage of a law on

intellectual property, which would immediately place science on a market footing, would be a much more important step for the fate of science.

The lack of development of the legislative base, the situation when some laws are still in force, while others no longer are, when many laws and norms are still left over from the former Union, is leading to ambiguities of various kinds.

On the one hand, the distribution of assets has been transferred entirely from government officials and the leadership of the academy to the Latvian Science Council. The council itself determines how much of the assets to allocate to physics, how much to chemistry, and so on. The expert council for the field deals with the distribution of assets within physics and with questions of the financing of specific research programs.

But the same programs can be financed from completely different sources: philanthropic foundations, the assets of public organizations, and, finally, on a commercial basis.

The financing from the union budget of the scientific organizations of the republic, which are performing jobs within the framework of 16 union programs, is continuing, and for the present, in the opinion of Vice President of the Latvian Academy of Sciences Uldis Viesturs, there are no obstacles to the continuation of these jobs. Of course, if the State Committee for Science and Technology were to cut off financing, the majority of them would be beyond the means of the republic.

Another problem is, who specifies science policy in the republic? In part, these functions are passing to the Latvian Science Council, but its freedom will be seriously limited by the disproportions that have formed in Latvian science. It is very likely that the best pieces of the modest budget pie will fall to powerful and economically efficient scientific organizations. This is having the result that in the republic many people consider it advisable to place science—at least in part—in the hands of the state. "A small republic can take the liberty to have the state deal with this," they are saying here. The future law on science should become the main tool, which regulates the status of state scientific institutions and the academy of sciences, the rights of scientists, and the competence of the Science Council. However, thus far these happy times have not arrived, the presidium of the academy to some extent retains the management of academic institutes and is creating new ones, while discussing at the same time the fate of the already existing ones.

The fate of institutes, perhaps, is the most complex problem. Legally existing within the Latvian SSR Academy of Sciences and operating within the framework of union programs, many of them are afraid of finding themselves left to the mercy of fate. It is not ruled out that institutes will have to organize some kind of association, something like a council of directors, and to take care of themselves. It is possible that a portion of

them will also be able to remain within the new "personal" academy—the law on science will concern state scientific institutions and does not prohibit the academy to establish its own institutes as a public organization. Indeed, why ought there not be private, church, party, and all other possible scientific institutions? Provided, of course, the leadership of the republic would make up its mind and allow science to be independent.

Among the possible versions of the future fate of academic institutes is their gradual merging with the system of higher education, first of all with the university. This idea is being discussed widely in the republic. Just recently the presidium of the academy of sciences jointly with the university established the Institute of Mathematics, last year it established the Institute of Molecular Biology. The advantages of such a merger seem obvious—higher educational institutions obtain an excellent scientific base, leading scientists teach, associate with undergraduates....

Nevertheless, thus far there is not one project that is completely thought out and takes thoroughly into account the interests of academic institutes and higher educational institutions. In Latvia, as in Russia, universities were traditionally perceived as centers of education, scientific research at higher educational institutions was considered a luxury. And higher educational institutions perceive such a "merger" not as a gift of fate, but as a burden.

It must be said that in Latvia this problem is not speculative. Without the quickest reform of the system of higher education and without the radical improvement of the scientific base of higher educational institutions the republic in the shortest time risks being faced with a catastrophic "brain drain," which only economic difficulties, if you do not take into account political conflicts, will limit.

The Latvian leadership is interested in large-scale science coming as quickly as possible to higher educational institutions. Inasmuch as the natural means of merging will take too long—university instructors are not burning at all with the desire to see "aliens," and far from all scientists aspire to teaching, are counting on administrative steps.... It is difficult to assume how this process will occur. The changeover to Latvian will greatly reduce the influx of matriculants and, thereby, competition. Many specialties simply will not exist at Latvian higher educational institutions, while nearby there are higher educational institutions of Russia, the Baltic republics, and, finally, Western Europe.

In the present situation it is extremely important for Latvia not to lose the established ties with Russia. The severing of these ties would mean that the economy of the country would actually have to be developed all over again. For science this would be a catastrophe. Whereas the obtaining of independence has already faced Latvian science with certain difficulties, a policy of self-isolation would simply kill it.

Latvian scientists understand this. In the words of President of the Latvian Academy of Sciences Janis Lielpeteris, the scientific ties of the republic for the present have retained for the most part the former direction. Last year Latvia concluded agreements with the majority of union republics, as well as with the USSR Academy of Sciences.

Against the background of these intense ties cooperation with the West seems rather colorless. The next thing today is the establishment of strong ties with West European countries. Now Latvia already has agreements with the Scandinavian countries, soon an agreement with the European Academy of Sciences and Arts will be signed, and the conclusion of an agreement with the Royal Society of Great Britain is anticipated in November. These are only interacademy ties, not governmental ties. Ties through UNESCO are becoming significantly more active—the admission of the Baltic countries to the United Nations contributed to this.

The ties of the Baltic countries with each other are even closer. Joint meetings of the presidiums of the academies of sciences are already being held and common scientific programs, in which their Scandinavian neighbors and Finland are joining, are being formulated; these are environmental protection programs. The publication of joint scientific journals—on solid-state physics and demography—is planned. They should be published in English and consequently may become truly international.

Whereas it is difficult to establish ties with the West, it is difficult to loosen the ties with the former indissoluble Union. One of the problems here is the problem of property. So far both sides have refrained from rash steps—and this has made it possible to preserve scientific collectives and to continue the work on programs. However, difficulties are possible: for example, the fate of institutes, which worked mainly for defense and were fed from the union budget, is unclear. It is not ruled out that they will refuse to feed them both in the Union and in the republic. But there are about 50 such organizations in Latvia—approximately half of all the scientific institutions. As A. Volfson of the Institute of Chemical Physics of the USSR Academy of Sciences believes, in order to be in line with the proportions that have formed in the West, it will be necessary to reduce at least by a factor of four the number of scientific personnel (PRIRODA, No 9, 1991, p 4). It is easy to imagine what fate awaits the associates of these institutes. Of course, some of the people will go into the system of higher education, into industry.... But still the process will be painful.

Science of Latvia today is at a turning point. If the new leadership of the republic proves to be sufficiently wise and rejects national extremism, if as before Riga is a crossroads of the Baltic, and if human rights are strictly observed (incidentally, western aid to the Baltic region is linked with the observance of human rights), Latvia has all the means to become a small country with large-scale

science, with highly developed, high technology works, and all the prerequisites for prosperity. There would be enough patience and common sense!

Estonian AS Official on Reorganization, Transition to Independence

927A0045A Tallinn ESTONIYA in Russian
24 Sep 91 p 3

[Interview with Vice President of the Academy of Sciences of Estonia Mihkel Aleksandrovich Veyderma by ESTONIYA correspondent A. Favorskaya; place not given: "The Science Policy of Estonia"—first paragraph is ESTONIYA introduction]

[Text] The science policy of Estonia should be such that our scientists would want to work all out for the benefit of the development of the science, economy, and culture of Estonia, Vice President of the Academy of Sciences of Estonia Mihkel Veyderma said on the first day of independence of the republic while talking with our correspondent....

[Favorskaya] Thus, Mihkel Aleksandrovich, the moment is a historical one: The anchor chain has been cut in two, Estonia has embarked on an independent cruise.... Everything is changing. How do you scientists see the place of science under these new conditions? For in the republic in past years recognized scientific schools formed, many scientists have personal international authority. How is all this to be used best for the good of independent Estonia and what is already being proposed? Earlier there were already disputes on how to treat the Academy of Sciences and whether to "add" in general the academy and its institutes to universities.

[Veyderma] You know, these suggestion began to be heard again most recently, particularly on the part of universities. But my opinion is that now a judicious, weighed approach based on the principles of the continuity and particularly the updating of science (in the sense of the structure, themes, and personnel) is fundamentally necessary. It is necessary to preserve our best traditions and scientific schools and to consolidate precisely the directions that are at the world level. Given our economic indigence it is necessary to think about how to concentrate our scientific forces, *where first of all to invest assets in order to obtain the greatest return in the interests of science, education, and the republic as a whole*. In the technical sciences, in the exact and natural sciences, in the economic sciences—in all sciences.... That is, a thorough audit is required. Including with the enlistment of foreign specialists, inasmuch as in individual directions we do not have enough of our own specialists to evaluate objectively our qualitative level from the standpoint of the world level. Now we have begun such work with the Swedish Royal Academy.

[Favorskaya] It is clear that the republic has few assets and it is necessary to proceed from this. Moreover, something has also already been done for the integration of science of the academy and universities: The Institute

of Cell and Molecular Biology, for example, appeared on the basis of Tartu University and the Estonian Biocenter....

[Veyderma] In the same way as the joint laboratory of the same university and the Institute of Ecology and Marine Research of the academy. It is necessary to continue the integration of higher education and science, including the transfer to universities of entire institutes, sectors, and laboratories in the area of the basic sciences.

And at the same time in Estonia, I believe, as in many countries—Germany, Sweden, or Finland—there should be scientific institutions that are financed directly by the state. The organization of science in general should be more flexible. Excessively large institutes, with a staff of 300, for example, are not needed, but we have ones like that. A problem has arisen with departmental applied institutes—the institutes of shales, construction, silicate concrete, and so on—with various affiliates and departments. If you take the telephone book, you will find about 20 of them, mainly of former union subordination. It is necessary to integrate them in the science of Estonia to the degree that this is possible and effective. It is necessary in general to find the optimum structure of scientific institutions for the republic. And the main thing is not to put this off.

[Favorskaya] In the republic, we are well aware, there were always difficulties with the introduction of scientific results. An idea was developed and was brought up to a prototype, but most often of all it never reached the point of the series production or industrial synthesis of the product. No one decided to bear the expenses at this most difficult stage and to take risks. But what about now?

[Veyderma] Now three special funds have been established in the republic for the support of development at all stages. The Science Fund, the Information Science Fund, and the Innovation (Introduction) Fund. But everything is not going as smoothly as might seem. Yes, with information science and computer technology things are in order: All three stages of their development (from scientific research to introduction) are covered by these funds. But what about in the area, say, of chemical technology, wood processing, and construction materials—everything that is so necessary in the republic? This development given the present structure of the funds, as we see, is not being ensured.

At the same time it is also not necessary to do everyone on one's own. Where advisable and possible, it is necessary to enlist western firms and institutions.

I also believe that it is necessary to return to republic comprehensive scientific programs, but in an updated, more goal-oriented form.

[Favorskaya] In recent times in our country they have somehow not been popular.

[Veyderma] I am certain that they are necessary—the energy program, the ecology program, the programs on timber processing, construction materials, agriculture, and so forth. Under present conditions the usual department approach might simply undermine the future of the republic. Our problems are all complex. An extensive examination of the problems of the development of the power complex of Estonia has been undertaken, which is pleasing. This is not yet a program, but already a concept. The production of shale, its processing, economics, ecology, the social aspects, local interests, republicwide interests, and so on are taken into account there.

[Favorskaya] You directed at one time the comprehensive phosphorite program....

[Veyderma] The government of the Estonian Republic three years ago asked that the problem of Rakvere phosphorites be examined in detail. We prepared a voluminous report—more than 100 pages. A political decision was made, but nearly all the material simply remained on the shelves—unclaimed. But recently I looked through it again. And, you know, I believe that from the standpoint of precisely a comprehensive approach this work can be a kind of procedural example. The Society of Geologists, incidentally, decided to publish it.

[Favorskaya] Do you believe that Estonia all the same will have to return to the problem of mining phosphorites?

[Veyderma] Phosphorites are our great wealth. Under the conditions of independence we should also study in the future the possibilities of their efficient and ecologically clean use. I am certain that sooner or later, when new technological solutions have been worked out and their economic effectiveness from the standpoint of the world market has been established, we will return to the problem of the use of phosphorites, particularly of the deposit in Toolse. For example, within the Kunda Cement-Phosphorite-Power Complex, of course, on a reasonable scale. In world practice very difficult problems have been solved, the West has many effective solutions, which were dictated by strict economic steps in case ecological norms are not observed. I, incidentally, was in Frankfurt at the chemical exhibition in July, and the main thing that was shown there was ecologically clean technologies. So that with respect to the use of our natural resources in collaboration with the West new opportunities are being afforded. Without power and without the production of materials for the the world market we will simply not be able to survive.

[Favorskaya] And how, in your opinion, will the free market influence science?

[Veyderma] It will especially affect applied science—some competition, including between our and foreign collectives, will arise. True, so far enterprises are thinking more about how to survive today and are not taking a look at the future, where without science they simply will not survive. But now the situation is

becoming aggravated. Very vigorous work of our scientists, economists, and engineers will be required, the consideration of the conditions and requirements of the world market will be required in order to hold out in the competition that is in store for Estonia.

[Favorskaya] Is something already being done here?

[Veyderma] I would say that the scientific potential of the republic during the so-called transition period was not used fully for this. But now, under the conditions of our state independence, this is a central question. A social order to science is needed. For the same comprehensive programs, I have already spoken about them. It is necessary to use in a very well thought out way the material and monetary assistance, which western countries are offering the republic.

[Favorskaya] Do you mean to say that there should be priorities here?

[Veyderma] Yes, I believe that we must not buy consumer goods. It is necessary to acquire the latest technologies and to solve the basic ecological problems, in order to begin ourselves to make new products and to establish here a competitive economy. I think that the inhabitants of our republic are prepared to be patient a little longer, provided the questions, on which our further development depends, will begin to be settled. So that it is necessary to think over very, very much—where are the priorities? Where is foreign aid to be sent? Scientists should give their suggestions in a thorough and substantiated manner.

I would suggest, for example, among the priority steps to help the Tallinn Water Treatment Plant with assets and equipment. It is intolerable that half a million inhabitants drink such water as today. But what is the matter? The water already at the first stage is being inadequately purified, and in case of chlorination harmful organochlorine compounds form in it. Thus, when one of our Finnish colleagues took samples of the drinking water in our cities, the figures of the content of organochlorine compounds were *a factor of 10 higher* than in cities of western countries! This was unpleasant news. In Moscow and several other cities of the USSR this problem with drinking water was solved by its ozonization. We want to direct the attention of our government to the fact that first of all it is necessary to settle the questions connected with the health of people.

In short, I will repeat, it is necessary to use in every way the scientific potential of the republic. To rely on the reserves that scientists themselves suggest.

[Favorskaya] But the Science Council headed by Academy President Arno Keema and the rectors of our universities was established quite long ago under the government of the republic. Is this council working?

[Veyderma] It is, but precisely now the time has come for it to work vigorously. To formulate and submit to the government the fundamental proposals of scientists.

[Favorskaya] How soon is it possible to do this?

[Veyderma] It is possible, I believe, in a month, in two to three, not more. There is no time to be lost.

[Favorskaya] Tell me, the participation of Estonian scientists in major union programs, has it been buried?

[Veyderma] Two years ago nearly one study in three at our academy—30 percent—was financed through all-union programs! We were also prepared to cooperate further in the fulfillment of specific studies and proposed themes on contractual bases. The corresponding agreement for this year, for approximately 10 million rubles, was even signed. But, with the exception of two directions, they never opened financing for us and said: "Unfortunately, there is no money." What is there in the future? Time will tell. We are prepared for cooperation wherever this is effective and justified.

We should be open both to the East and particularly to the West. We stewed too long in our own juice. But modernization without contacts is impossible. It is necessary to send more of our gifted young scientists for practical studies to foreign scientific centers and to organize broader scientific and technical cooperation.

[Favorskaya] Does not a language barrier problem arise here?

[Veyderma] Indeed, there is such a thing. A fairly large number of offers to hire or to accept for practical studies our young scientists have already arrived from western universities. But it turned out that it is rather difficult to find candidates—such ones who, apart from everything else, would know languages fairly well. Several months ago, for example, several tens of people responded to the offer to do some work on a stipend of the British Council at universities of England. But for this they had to

respond competently in writing to the questionnaire offered by the British—to tell about one's scientific activity and its results, to explain why you are applying for a stipend, to state how you intend to use your potential upon returning home, and so forth. And then to go through an interview in English. And many of the candidates simply left immediately.

[Favorskaya] This is serious. Is this a reproach first of all of the secondary school?

[Veyderma] Of course. But also of young people themselves. It is necessary to teach communication in foreign languages by all possible means, not only in lessons! Today people need an active language!

[Favorskaya] But are you not afraid that intellectual migration from Estonia will begin as a result?

[Veyderma] But I am saying: The science policy of our state should be such that our scientists would want to live and work at home. At the same time one must not be afraid of the departure of several people.

[Favorskaya] One of the scientists said well: It is necessary to know how to be proud of our emigrants. It is necessary to stress in every way: They are ours. And then they will return without fail, the homeland always summons.

[Veyderma] Of course, apart from everything, this is so and will thus have useful feedback with Estonian science.

I would like once again to appeal to our scientists and specialists in general to voice now their opinion regarding the optimum structure and organization of science in Estonia. This should become the subject of the broadest discussion.

[Favorskaya] I hope that in the newspaper this will simply be heard. Thank you for the interview.

Russia Seen as Lacking 'Infrastructure for New Technology'

927A0099A Moscow RADIKAL in Russian
No 47, 4 Dec 91 p 3

[Article by Petr Deynichenko: "The Technology of the Transfer of Technologies"]

[Text] "Oh how difficult it is to transfer technologies! Particularly to our country...."—that is how the participants in numerous meetings of Soviet and foreign businessmen, which took place in Moscow between 20 November and 29 November, assessed the state of the problem of technology transfer.

The specialists who spoke at the most diverse forums—economists, scientists, businessmen, and managers—were just as unanimous in this as in the overall assessment of the state of our economy: The situation is bad, but the worst is still ahead.

Several statements were so pessimistic that I. Bortnik, deputy chairman of the USSR State Committee for Science and Technology, exclaimed at the beginning of his report: "There are so many problem in technology transfer that is it, perhaps, not worth engaging in this?" There are, indeed, more than enough problems. Some of them—such as the regulations of the Coordinating Committee on Export Controls or the domestic political situation in our country—are still of an "external" nature and lend themselves to solution by political means. The deep-seated problems, which are connected with the economic state of the country and the psychology of the Soviet individual, are far more serious. One cannot solve them either by good laws or by good will.

The most important one is the ever widening technological gap between the West and our country. (It would be more precise to say: between the West and the former eastern bloc.) Strictly speaking, technology transfer should also overcome it, the trouble is, however, that the gap exists not only in production, but also in consumption—that is, in the consciousness of people. This last factor is contributing even more to the widening of this gap. The simplest example: In the United States today 34-35 million personal computers are in operation. In the immediate future both their number and their capabilities will increase substantially. This means that already today several tens of millions of people are constantly working with them, are improving programs, are writing new ones, and are adapting computers to newer and newer types of human activity. In the former USSR there are only about 2.5 million personal computers and the market is already saturated. In reality the capacity of our market should be comparable to the capacity of the American market. But the low standard of living, the wretched state of the infrastructure, and, let us say frankly, a very "average" education are preventing this.

As R. Land, who spoke in the section "Technology Transfer" within "The Days of World Business-91," believes, the problem of our country is that we do not yet perceive the formed technological gap as such, for we do not have the appropriate infrastructure to use new technologies fully and properly. We are spending a huge amount of labor on what is easy and simple throughout the world. We are afraid to retrain people—but our people have gotten out of the habit of studying and have forgotten how to study. We are afraid to form new needs among people—after all, we cannot meet the essential needs. As a result we are missing the opportunity to create in the country a market that could absorb a huge quantity of new technologies and high-technology products.

Once at the dawn of perestroika one of the Komsomol workers who visited the United States said that, sitting here, we do not understand and do not notice that "America is breaking away with a whistle." And so, it ALREADY HAS. We will not catch up with them. We have only to convince them not to throw us to the mercy of fate...for then our entire country is actually taking the risk of turning into a "national park," about which our famous movie director S. Solovyev dreams, or into the zone of "an economic Chernobyl," which it is cheaper to fence in and not to permit anyone into than to recultivate.

But they might throw us. Because the protection of investments is not guaranteed, there is no political stability, there is no capital market.... But we all do not want to get to work on the infrastructure (transportation, communications, education), for building good roads is not like clipping coupons, and are blaming everything on objective conditions.... There are not even the necessary laws, although they are willing to help us in drafting them, it is only a matter of passing and observing them.

But then there are the "trowel" conceit and arrogance. We are putting our hand into the world market of technologies, without knowing how to sell them and without wanting to learn this. Instead of going to a potential buyer and offering our commodity, we say: Come, have a look.... All this, it appears, is the same overconfidence of the monopolist, which enables our producers not to think about marketing, about design, or about the ergonomic quality of products.

In the statements of foreign specialists at times very harsh criticism was heard: from the simple "you do not know how to trade" to "you do not understand and underestimate the importance of high-technology equipment" (R. Land). Mr. Land means that we poorly understand what scientific and technical progress is. And, it appears, he is correct, if the Soviet partners of his firm incorporate in equipment being developed a depreciation period of 12 years. Meanwhile the turnover of such equipment in the West is two to three years. Our management—if in general it is possible to use such a concept as applied to our country—was subjected to the same harsh criticism. In the words of I. Bortnik, today in

the organization of business, in finance, and in economics everyone "is out of his depth." Of course, in many respects our poverty is to blame for this, since throughout the world billions are being invested in management and personnel training. None the less we are economizing, even when there is an opportunity not to do this. How is one to explain that the protocol on the training of personnel for economic activity, which was signed with France, is being implemented unsatisfactorily through the fault of the Soviet side? (This was spoken about during the round table of the National Council of French Employers and the Science-Industry Union on 21 November.) Of the annual quota of 6,000 people only 1,500 underwent training, but France granted credit in the amount of 600 million francs for this program.

It must be said that the Soviet participants in the meeting were in a no less critical mood. At the opening of "The Days of World Business" B.Ye. Paton, president of the Academy of Sciences of the Ukraine, said bluntly that the complete incapacity of the system that existed—and in many of its features still exists—for technological retooling was one of the causes of such a deep crisis in our country. The assistance of the West will actually be effective, only if it is concentrated on the transfer of technologies, moreover, these should be socially significant technologies, the use of which would make it possible to increase sharply the standard of living of the people. But technological assistance is possible only in case of conditions, which are favorable for world business, on the entire economic space of our country. First of all the possibility of exporting and reinvesting the profit should be ensured, and the problem of protecting intellectual property should also be solved.

But it is not only a matter of guaranteeing the West the proper conditions. We are still the main obstacle. I. Bortnik noted that we simply do not have stimuli for the attraction of new technologies. What are they needed here for, if there is no real competition, there are no problems with marketing, there are not even benefits for those who introduce (here once again is a purely Soviet term—to introduce [vnedryat]!) new technologies? Things will get going, if we at least stop taxing the cost of the acquisition of patents, copyrights, licenses, and software, the expenditures on the patenting of our own technologies, and so on. Moreover, the profit, which is reinvested within an enterprise, must not be taxed. An enterprise, which buys a license, should receive tax credits that are similar to the credits in case of the building of a completely new works. Such in general terms is the essence of the proposals of I. Bortnik. Only in this way is it possible to solve the primary problem for us—the transfer of technology from the laboratory to production. If we cannot achieve this, all the talk about technology transfer will go to rack and ruin, for the competition among our firms often is not longer to see who can sell technology more profitably, but to see who can give it away more quickly. We can, of course, take consolation in the fact that we do have "substantial reserves" and "traditionally strong areas"—such as

space, thermonuclear fusion, materials, laser technologies.... And the participants in the section "Technology Transfer" related their developments to their colleagues. But after the reports of our prominent economists, which were heard the first day, all this suggested the words from a ditty that was popular a while ago: "I am the worst, I am filth, I am a good for nothing...but then I know how to fly." And this statement hardly inspired our western partners. The "World Laboratory" Program, on which Academician Ye.P. Velikhov is counting, is still sooner an exception. Not by chance is this a nongovernmental program. Western entrepreneurs are not a charity. The West will give us something only in exchange for our resources and cheap manpower. As it gave something once to Thailand and Taiwan, Mexico and, by the way, Japan. The results will depend only on us, because in reality the West for the present does not have too much of a need for new sales markets and does not need strong competitors at all.

This is probably not the last reason that the regulations of the Coordinating Committee on Export Control for the present remain in force and that politically we still do not have the right to work in the system of the European Community. A decision at the level of the European Parliament is needed in order for us to be able to participate in such programs as Erasmus, Tempus, and others.

Today we urgently need active participation in international scientific cooperation. Only it can still save our basic science, because today we are faced with the threat of the disintegration of many scientific schools in our country. If this happens, this will be a blow for all world civilization.

We have an extreme need today for ecologically acceptable technologies, the main criterion in which would be cleanness, and not economic gain. Unfortunately, there is the danger that the republics, which after withdrawal from the Union have found themselves in a difficult economic position, will sacrifice ecology for the sake of immediate effectiveness.

We need special programs—without references to our political instability and strifes—programs that are backed with capital. We need cooperation with European venture capital. Finally, we need the good organization of business.

While the West needs to put aside its hesitations. Since indecision will not lead to anything good—the economic chaos and ever increasing political stability on one-sixth of the dry land, given the fact that in the majority of countries there is by no means heaven on earth, inevitably will also sweep over the islands of well-being, which now exist and make the "economic weather."

However, judging from the results of the talks with the Big Seven, the West hopes for the present to make do with a little—humanitarian aid and political support. It appears that they cannot bring themselves to bet on the Union, are afraid to bet on Russia....

In any case, we cannot count in the immediate future on a new Marshall Plan. We will have to come to the surface on our own.

Scientists Losing Access to Western Technical Literature

927A0082A Moscow *RADIKAL* in Russian
No 44, 13 Nov 91 p 6

[Article by Petr Deynichenko under the rubric "Quo Vadis": "They Are Burning Libraries Quietly, Without Smoke and Fire"—first paragraph is *RADIKAL* introduction]

[Text] Soon, it appears, there will be many scientists and little science in our country. The catastrophe came from an unexpected direction. The very foundation of science—free information exchange—is collapsing. And not of anyone's ill will—we simply no longer have the money for it. It remains only to hope for "humanitarian aid."

While scientists multiplied the academies and engaged in politics, the thin stream of fresh scientific information, which still trickled to us from the West, was gradually running dry—and now has dried up almost completely.

In 1992, if urgent steps are not taken (if, of course, at least some steps are still possible), the majority of our scientific libraries will be left without foreign scientific journals. Books will also not arrive at libraries. The reason is most trite—there is no currency. We always knew how to fight better than to work, and as a result even the little that there was had to be given up for bread.... As usual, there was not enough for science.

In our country they like to call science a new productive force of society. But the nature of its financing—even in such a trifle as information exchange—testifies that, most likely, in the immediate future we do not intend to produce anything. Probably in the distant future as well: The sharp reduction and actually the halt of information exchange in the area of the natural sciences will have an effect not today, but somewhat later.... But by then the train will have already left.

The disturbing trends have existed for more than a year. But only now has the crisis reached the scale of a catastrophe. The Library imeni Lenin, the main library of the country (no matter what they say there), in 1992 actually remains without foreign periodicals. Even in the best of times they received here not more than 10 percent of all the publications put out in the world, although for normal operation a library of such a level should receive 20-25 percent. In essence, the State Library imeni V.I. Lenin never operated normally, and Soviet readers were always on starvation rations. But tomorrow there will not be even this.

In the last few years—at any rate since 1988—the number of foreign publications, which were received by the State Library imeni V.I. Lenin, steadily decreased.

This year journals have ceased almost completely to be received, while the books, which are still being received, are not 1991 orders, but the "arrears" from previous orders.

At the All-Union State Library of Foreign Literature foreign exchange subscription has been reduced sharply; the Library for the Natural Sciences of the USSR Academy of Sciences and the Institute of Scientific Information on Social Sciences of the USSR Academy of Sciences were actually left without foreign subscription.

There are many reasons for this. Throughout the world the prices for books and periodicals are steadily increasing. Whereas in 1990 the average cost of a foreign book came to \$87, while that of a complete set of a periodical came to \$329, the anticipated cost in 1992 is respectively \$114 and \$428. In other words, just for the maintenance of the current repertory of foreign publications the State Library imeni V.I. Lenin, for example, will need an additional \$245,000. But annually the number of books and journals increases by 5-7 percent!

It is less well known that the shortage of currency did not arise today. The hasty selling of gold, which made an impression even on the Soviet people who have seen the world, is merely an unsuccessful attempt to block up if only somehow the gap in the budget which went bankrupt long ago.... Our libraries for a long time have been receiving money only on paper. Thus, at the beginning of this year the State Committee for Science and Technology allotted the Library imeni Lenin even 750,000 foreign exchange rubles—250,000 exchange rubles more than last year. However, it turned out that this is merely a figure. No real assets were behind it, moreover, after the introduction of the commercial rate of exchange of the ruble they demanded from the State Library imeni V.I. Lenin for these 750,000 foreign exchange rubles 2.5 million "wooden" rubles. Of course, the library did not have them. (By the way, specialists of the State Library imeni V.I. Lenin believe that for the achievement of the optimum level of the building up of collections of foreign literature it is necessary to increase the allocations by 10.7-fold, or by \$7.8 million.)

Last year and at the beginning of this year western firms still continued to send our libraries books. But when, not having paid the old bills, we began to ask for credit for 1992, their attitude changed. In just a few months the stereotype "the Soviet Union is a reliable partner," which was present for many years in the book trade business, crumbled. So that it is not that there was currency and suddenly it came to an end. They simply ceased to lend us money and are demanding the settlement of old debts. But for the State Library imeni V.I. Lenin today even \$1,000 is a sum of money.

A most serious situation has also formed with the libraries of the USSR Academy of Sciences. Their fate depends on the fate of the academy itself, the future of which for the present is also unclear. In any case the academy does not have money, its libraries also do not

have it. Even the institutes, which attempted to obtain at least something for their hard-earned money, were left with nothing: All the assets, which they remitted for subscription, were used for the settlement of old debts.

The arrival of foreign books and journals at the Library for the Natural Sciences of the USSR Academy of Sciences has stopped almost completely. But it acquires foreign literature for about 200 other libraries in the country. Just as for many others, the *Mezhdunarodnaya kniga* All-Union Association, which until recently had a monopoly on appearance on the world market, became a stumbling block for the Library for the Natural Sciences. Earlier it farmed out orders among intermediary firms, there was almost no monitoring of the filling of an order. As a result the Library for the Natural Sciences annually failed to receive books and journals worth 500,000 foreign exchange rubles, not to mention the fact that, just as many other libraries, the time of the arrival of scientific literature in the country did not suit it. American journals got to the reader only four to eight months after publication, which, of course, is completely intolerable.

It is difficult to say what prevented *Mezhdunarodnaya kniga* from working at the level of western firms—the desire to accumulate orders and to buy books at wholesale, with a discount (in this case it reached 30 percent) or simply the irresponsibility of the monopolist. In either event, our libraries more and more often, in spite of all the obstacles, began to turn to the services of western intermediary book trade firms—Lange-Springer or Faxon. Their services, naturally, are more expensive, but the orders are filled in full and on time.

True, even when negotiating directly with western firms, the libraries were forced to conduct their financial activity as before through *Mezhdunarodnaya kniga*.... Now, however, this is not that important—there is no currency anyhow. For the Library for the Natural Sciences it disappeared starting in 1990. Meanwhile letters from publishing houses with the demand for payment began to arrive. However, on the list of priorities of the Committee for Foreign Economic Purchases, to which the Library for the Natural Sciences applied, libraries were at the very end. Raw materials, medicines, foodstuffs, components for industrial enterprises...were in the first ranks. They did not give any money. The bills have not been paid since 1990.

Nevertheless, in 1991 the Library for the Natural Sciences still received an entire set of scientific journals. This occurred owing to the fact that Lange-Springer purchased journals from publishing houses in the amount of 7 million marks [DM]. Incidentally, the total debt of all the libraries of the Academy of Sciences to Springer now comes to DM15 million. Representatives of Springer went to I. Silayev, asked that the debts be settled, and also appealed to Yu.S. Moskovskiy, chairman of the board of the USSR Bank for Foreign Economic Relations, but were turned down and did not

get any guarantees for 1992. Springer for the time being is continuing to send us literature. Perhaps, out of humane considerations....

The situation at the Institute of Scientific Information on Social Sciences is also similar. In 1991 the presidium of the USSR Academy of Sciences allotted the institute about 1.5 million foreign exchange rubles. However, this money was never received. As a result the library is receiving books and journals for the most part only from German firms. The English firm Collets, which made purchases for *Mezhdunarodnaya kniga*, did not place orders at publishing houses, since *Mezhdunarodnaya kniga* did not remit currency. (*Mezhdunarodnaya kniga*, however, assures that the money was remitted.) Pergamon Press, Willey Sweet, and Maxwell also sent notices on the impossibility of filling orders.

All journals arrive late, while books have nearly ceased to arrive. According to the data on 24 October 1991, of the 597 books ordered in the United States in 1991 only one had arrived at the library; none of the 695 British books had arrived; four books had arrived from France with an order of 730.

As we see, the facts speak for themselves. Libraries by their nature cannot operate under market conditions without strong state support. Reliance on commercialization inevitably leads to the reduction of scientific work at the library—and this is bibliographies, the development of data banks, and much more—and in the end the library ceases to be scientific. If the state has no money, no one except the public, patrons, and scientists themselves can aid libraries. However, this aid will hardly be substantial.

To a large degree book exchange remains today the only means of supplementing collections. In the world our country probably accounts for its largest share. In general book exchange is gradually going out of fashion, remaining the basic means of supplementing libraries only for underdeveloped countries. First, it is possible to obtain far from all publications through book exchange and, second, it also requires considerable assets. Earlier our leading libraries received so-called deposit copies, which were used in book exchange. Now this practice has been curtailed, while the majority of new publishing houses are simply ignoring it. Besides the outlays for the acquisition of literature book exchange also requires many additional expenditures. For example, postal services are constantly increasing in cost, and the cost of delivery soon will compare with the cost of books (the History Library spends about 1,000 rubles [R] a week just on the sending of printed matter). Underdeveloped countries can afford this only because labor there is cheap. For wealthy countries book exchange is more a form of charity.

In essence, book exchange is barter. It is supported for the most part by the subscription of foreign libraries to Soviet publications—for rubles. In turn they make their periodicals available to us. But this year libraries also

began to experience a shortage of rubles. The State Library imeni V.I. Lenin, for example, needs R253,000 for subscription.

For fairness' sake it must be noted that the situation of the libraries, which are financed by Russia, is better. At the History Library, which is subordinate to the RSFSR Ministry of Culture, the wage is a little higher and for the present there is enough money for the subscription to and the purchase of literature. This year the library received about 500 titles of foreign journals in humanities disciplines and, apparently, will also receive them in 1992. But the difficulties, which arise when conducting international book exchange, also affected this library, moreover, the budget of Russia is not enough for everyone.

On 1 November the Fourth All-Union Conference on International Book Exchange concluded in Moscow. Inasmuch as book exchange in the immediate future will probably be a most important source of the supplementing of our libraries, the conference participants addressed to the Committee for the Emergency Management of the National Economy the request for comprehensive assistance to libraries that are conducting international book exchange. It was also decided to ask the presidium of the Academy of Sciences in case of the conclusion of contracts with foreign firms on the joint publication of journals to sell a portion of the printing for rubles—if only to libraries. Unfortunately, our libraries are simply in no position to buy many of our scientific journals that are published abroad. A subscription to SIBIRSKIY MATEMATICHESKIY ZHURNAL for next year will cost \$680—and libraries will not be able to purchase even a deposit copy.

Moreover, the conference recommended that the system of making a deposit copy available be retained.

Will these modest steps have any effect? At least this is the trifle that can still be done. The conference participants were far from optimism, the associates of libraries are also no closer to it. In the opinion of the latter, it will no longer be possible to avoid a catastrophe. It is only possible to moderate its consequences....

In either event, having become dependent on western charity and the current political situation, our science, particularly budget-carried science, most likely will withdraw from the front lines for a long time. The sharp reduction of information exchange and indifference to the needs of libraries may be the last straw.

In our times should libraries really burn in order for history to advance?

Sagdeyev Interviewed on Crisis of Nation, Science Establishment

927A0081A Moscow POISK in Russian
No 38, 13-19 Sep 91 pp 4, 5

[Interview with Academician Roald Zinnurovich Sagdeyev, USSR People's Deputy, by Yuliya Bogatikova, under the rubric "Life-Size"; date and place not given: "Sagdeyev's Comet"—first two paragraphs are POISK introduction]

[Text] Nearly two years have passed since the day when a sensational report went round all the central newspapers: Academician Roald Sagdeyev had married Suzanne Eisenhower, daughter of the ex-president of the United States, and had left to reside in the United States. This was an unexpected step, which astonished everyone, even his closest friends. They tried to guess: Is this really love or is this the forced emigration of a man who was not succeeding in completely realizing himself in his own country? But be that as it may, he left. A most prominent scientist left, having left to his successor, Albert Galeev, the Institute of Space Research, where they now joke with sadness. "Previously we studied Halley's Comet, now we are studying Sagdeyev's Comet." An uncompromising politician, who even during the years of stagnation was not afraid to express his own radical views, a man, who inherited the ideas of Sakharov and did not dishonor himself in any way, left. Remembering the words of Andrey Sakharov that a person, who has emigrated abroad, ceases to be a scientific and political figure who is in any way significant, they said that Sagdeyev "died" for our country.

No, he did not leave the political arena and, still being a USSR people's deputy, there, across the ocean, he is speaking in defense of our democracy. He was and remains a Soviet scientist and, what is the main thing, a citizen of our homeland, a man who does not know how to be indifferent to its difficult fate.

[Bogatikova] Roald Zinnurovich, back before "perestroika," and even during it you were noted for liberal democratic views which you did not consider it necessary to conceal. Has your opinion of the social processes, which are taking place in the USSR, changed with your move to the United States of America?

[Sagdeyev] I as before, just as earlier, am a most ardent supporter of the democratization of Soviet society. But in general, I would draw an analogy with what geologists do when studying earth from space—they use photographic surveying in order to develop a more general, integral view. So it is in politics as well—a view from the distance makes it possible to divert one's attention from the everyday confrontations between political trends, which, in essence, also do not differ very much from each other. While from outside you see and perceive all this more clearly.

[Bogatikova] Living in the United States, it is not that easy to devote yourself to the political life of our country. How are you managing to fulfill the functions of a USSR people's deputy?

[Sagdeyev] I realized that I would not be able to fulfill the duties of a people's deputy, that is, to meet with my constituents, therefore, I decided to retire. At that time I was a member of the Committee for Foreign Affairs in the USSR Supreme Soviet under the chairmanship of Aleksandr Dzasokhov. He asked me to stay and said: "Your functions are now purely propagandistic—to perform across the ocean explanatory work on what is happening in our country." At that time it was still unclear how the fate of the democratic—at that time—opposition would take shape, and I helped it as I could. I often had items published in the press and appeared on television and radio in defense of our emerging democracy. And now at least once a month Radio Liberty makes the microphone available to me. In general, I believe that the voices, which at one time were considered the "enemy's," played a large positive role in the life of Soviet society—they did not let democracy be stifled.

[Bogatikova] The failed coup attempt in the USSR showed that it is impossible to stifle democracy even by military force. How did you, and all Americans, perceive the August events?

[Sagdeyev] Starting at the end of November of last year, when the group "Soyuz" stepped up its activity and direct appeals for the introduction of martial law began to be heard, I feared such a coup every minute. I thought that Gorbachev would head it. Fortunately, we were all witnesses of how the USSR President found in himself the strength to move away from the conservative upper stratum. And starting on 22 April—the day of the meeting with the presidents of the republics—he traveled the path of real evolution. At midnight on 19 August the first TASS reports appeared in Washington. No one could understand anything. I began dialing the numbers of all the Moscow telephones I had. But in vain. With great difficulty I reached only Vasily Selyunin, who said: "Yes, this is a military coup." After a while Ted Poppil, who hosts a night-time radio show that is very popular in America, called me and invited me to take part in it. I gladly agreed.

All three days I practically did not sleep, trying to follow what was happening in the Union. CNN reported around the clock from the barricades. All America was glued to television screens. When the putsch was put down, Americans were even a little disappointed by the quick end of such a "most interesting series," which is incomparable even with the Persian Gulf war. Gorbachev's popularity immediately leaped sharply. His rating was even higher than that of Yeltsin. Apparently, this is explained by the sentimentality of Americans, who imagined "poor Mikhail Sergeyevich in isolation." After the putsch two pieces of news, as usual, one bad and one good, went round America. The bad one is that Gorbachev had surrounded himself with traitors, the good

one is that they all turned out to be imbeciles. I said that Mikhail Gorbachev had scorned the old Stalinist precept: "Personnel decide everything!"

[Bogatikova] The triumph of democracy razed the Communist Party of the Soviet Union to the ground. How did American communists perceive this?

[Sagdeyev] The Communist Party of the United States, and not just it, but all the social democratic and socialist movements of America are painfully enduring this event. They believe that the system of party rule, which formed in the USSR, discredited in the eyes of all mankind the very idea of communism. Recently in the press there was a long interview with Gus Hall, leader of the Communist Party of the United States, who believes that his party will have to endure a period of a decrease of interest in Marxism. I think that all of them have to revise their views. It seems to me that the division into black and white—"communism-capitalism"—resembles today the division into the High-heels and Low-heels in the work of Swift. In reality, it would be most correct of all to call the processes, which are occurring now in all countries, a mixed economy. But to what degree and in what proportions the spheres of economic life are divided depends on the system itself.

[Bogatikova] It is no secret for anyone that the Soviet Union in the formed political situation is on the verge of economic catastrophe. Ought we expect help, suppose, from America or "is the rescue of a drowning man the drowning man's own job"?

[Sagdeyev] Recently one congressman proposed to take \$1 billion from the Pentagon budget to give economic aid to the USSR. But U.S. President Bush for the present is in no hurry. And the latest public opinion poll showed that only 31 percent of the Americans are in favor of making such aid available, while 61 percent are opposed, in spite of the positive assessment of the victory of the democrats in the USSR. The point is that the Americans themselves are experiencing economic problems. There is a small production recession, but it is appreciable. For example, the budget of the University of Maryland, of which I am a professor, has been decreasing every year by 10 percent. And this is very significant—wages and incidental expenditures are being reduced. They have even gone so far as to reduce the staff of cleaning women, and now every staff member has to take out the garbage from his office himself. On the other hand, private capital, which could come to the USSR, is following anxiously how political events develop. There should be the certainty that democracy has finally triumphed and new codes of laws, which protect capital investments and the conditions for the development of market relations, have appeared. The Americans with respect to the USSR have advanced the slogan: "No cash!" They understand perfectly well that giving money to the USSR is the same as offering it to an alcoholic son—it will squander everything in an hour. The only thing, on which is it possible to count, is aid in food and medicine.

[Bogatikova] You returned to Moscow after such a long interval in order to take part in the extraordinary Congress of USSR People's Deputies. Why did you not come earlier?

[Sagdeyev] Until recently Alksnis and company did not vanish from television screens. I thought: I will come, but then they will introduce marshal law, and I will remain a hostage in their hands. After the putsch I understood that it was necessary to go at once. Many people perceived my appearance at the congress with a sneer: "Ah, the political emigrant has returned!" Yet I did not come empty-handed, but brought and turned over to the congress a number of letters from Americans, particularly from the Union of Concerned Scientists, with suggestions of USSR unilateral disarmament. And if such a step is taken, the West, perhaps, not immediately, but in a few years, will also have to disarm.

[Bogatikova] It is difficult to believe that such a thing is possible. After all, for us it is unrealistic to abandon if only purely psychologically the thought that we are still a superpower....

[Sagdeyev] Whereas we agreed with withdrawal from the clan of superpowers with respect to many areas of human activity—economic, social—it does not make any sense, in my opinion, to retain membership only in the nuclear part of the club of superpowers. One would like to know, why do we need so many nuclear weapons? What civilization are we protecting with them? I think that now is precisely such a moment, when the economy will grab us by the throat and force us to review the entire military budget, including the nuclear budget. If all the republics discontinue participation in the nuclear program, Russia, by withdrawing nuclear weapons from their territory, will itself be a hostage of its own gigantic nuclear arsenal.

Then the Ukraine, Belorussia, and Kazakhstan will understand that the tactical weapons, which are based on the territory of the RSFSR, can also threaten them. Why, then, include in the budget money for the maintenance of this nuclear arsenal? And imagine what it will be like when this gigantic budget rests on the shoulders of the Russian worker! Taxes will increase by two- to threefold! Of course, it would be splendid if the West and the other members of the nuclear club, having understood the changed situation and the decrease of the threat of aggression, together with our country would draft a plan of disarmament that goes much farther than the recent Treaty on Strategic Offensive Weapons. Unfortunately, the inertia of thinking in the West is very great. Today, as never before, the ideas of Eisenhower concerning the fact that the military-industrial complex is an enormous machine, which is very interested in capital investments, and you will not transform it that easily, are correct. Therefore, Russia will still have to agree to major steps on unilateral disarmament, the economy requires this. I think that the members of the USSR Academy of Sciences in this sense also have something to ponder over.

[Bogatikova] You are an academician of the USSR Academy of Sciences, which became in our country a kind of ministry that manages union science. You can compare it with a fundamentally different science—unmanaged, market-oriented, American science. In whose favor is the comparison and why?

[Sagdeyev] The USSR Academy of Sciences in such a form, in which it exists today, has become obsolete. If this is a ministry of science, and we openly acknowledge this, it is necessary to conduct business in it as in an administrative department. In reality at the Academy the elite, which is elected in accordance with traditions that emerged back in the middle of the 18th century, has the decisive vote. In some sense I would compare the membership of our Academy with the House of Lords in Great Britain, which for a long time now actually has not guided the life of the country. This is a purely nominal body. The House of Commons guides the country. So it also is in our science. It needs fresh forces, and not lords, who received a staff of office for life for achievements of nebulous youth.

I believe that it is necessary to preserve the Academy as a club of elected members, having retained for them only esteem and respect. The main distinction of American academies—and there are a large number of them—and of the largest one, the U.S. National Academy, is the fact that they do not supervise any scientific institutes, but merely put together from time to time various working groups for the formulation of recommendations or the evaluation of one scientific direction or another.

But in no case by order! So, there are more democratic principles of the management of science. Practically every laboratory and institute has members of the academy. They enjoy indisputably deserved authority and esteem, but do not have any more rights and privileges! If the USSR Academy of Sciences turned into such a national academy, it would be of far greater use than by interfering in the current work of institutes.

[Bogatikova] What do you think about the fact that during the putsch the leadership of the USSR Academy of Sciences "kept its mouth shut"?

[Sagdeyev] Expressing one's own opinion is a matter of conscience of every scientist who considers himself a citizen. And I am delighted with the fact that many institutes during the most troubled times of the putsch held rallies and adopted resolutions in support of Boris Yeltsin. Of course, our Academy of Sciences formally may also not consider itself a political organization, no one will condemn it for this. But even the conservative USSR Union of Composers—it found the strength to express its opinion! I am very sorry that the leadership of the Academy of Sciences did not heed the voice of the scientific community and did not find the courage to condemn the putsch. And thereby it jeopardized itself.

Why? When the economy of the country is in a most serious state, it is too difficult to find assets for basic science. Therefore, the support, which our science needs,

can come only from the democrats who have come to power. I do not know in what state the academicians-leaders will go to the meeting with Boris Yeltsin....

[Bogatikova] The crisis, which has enveloped the country, not only has struck a blow at the organizational foundations of the Academy, but has jeopardized all science. You as a Soviet scientist, who is concerned with space, apparently, are not indifferent to the problems of the cutback of our space programs. But what is the reaction to this in America?

[Sagdeyev] No malicious delight is being felt on the part of Americans. After all, they will also not succeed in maintaining a high level of allocations. Our countries always had a race syndrome. Entirely symmetrical propaganda even existed: We had "the launch pad of cosmonautics is socialism," they had "complete superiority in space research for proving the superiority of the American way of life." Now the USSR has fallen out of the race....

Of course, in America many people are talking about a mission to Mars. But these are the people who do not yet understand that the USSR has dropped out of the race. I always tell Americans: Yevgeniy Zamyatin had a satirical story about the future of communist society. There are two booths—at one they sell sausage, at the other they sell tickets to Mars. We do not have any sausage, and it will be very difficult to sell tickets for a flight to Mars.

But another problem is also arising. With the cutback of space programs our intellectual resource in this area is involuntarily disappearing. Of course, the Americans will not be able to assume our entire space budget, although it is several fold less than their allocations. On what ought we count? I made a proposal on giving foreign orders to our scientists. For example, the Americans have decided to launch a new station, while they will be able to order from us a launch vehicle for it. For the present talks are being conducted on this theme.

[Bogatikova] I am afraid that orders alone will not save science. The economic instability of our state is forcing scientists "to head for the West." We all understand that the "brain drain" is inevitable. But what, in your opinion, is the most reasonable way out of this situation?

[Sagdeyev] Americans often say that a slump of Soviet science is now occurring, and, they say, let us invite the most talented scientists to the United States on a contractual basis. I do not see in this anything terrible for the Union. The same thing also occurred in Western Europe after the war, when young scientists went to the States in search of the minimum material benefits and the possibility of creative work. When in their homeland the old scientific centers began to be restored and new ones began to be established, many came back. Not by chance is West European science entirely competitive today with respect to many indicators. I support the idea of contract systems and the giving of grants to Soviet scientists. The most important thing is that our country

in this situation would be able to appreciate the importance of basic science for the future of our country not just out of purely utilitarian scientific considerations, but would support initiatives of this sort and would create all the conditions for those who want to leave so that they would be able to return and to continue to work in their homeland.

[Bogatikova] There is also another cause of the "brain drain"—the lack of any social protection whatsoever. Such a problem probably does not exist in America, does it?

[Sagdeyev] In the United States the ideas of socialism and justice, which are based on collective ownership, are very strong. And precisely they constitute the foundation of the system of the social protection of scientists. For example, contracts—what are called "tenures" for a permanent job—exist only in the scientific sphere. There are a large number of political and public organizations, not necessarily of trade unions, but of unions of scientists and scientific personnel. Therefore, if a person works well, he will never lose his job. And, of course, young talented scientists are being supported in every way.

[Bogatikova] In our country young scientists, in order "to get a start in scientific life," often have to elbow their way....

[Sagdeyev] In any society it is necessary to know how to elbow one's way, but here it would be a good idea not to drown one's neighbor. Although the word "marketing"—the ability to show one's achievements, one's products—applies more to industry and to business, still in scientific work it is playing a large role. It is necessary to present scientific results and ideas well, to write an article, to find a good scientific journal, and to deliver a paper at a conference. And in Soviet science this should play a vital role. Even a larger role than contact with the strong of this world or promotion that uses party ties, which our totalitarian state system instigated.

[Bogatikova] I know that in our statements in the United States you often assess the social processes that are occurring in our country, thereby taking "an activity civic position." Why, in your opinion, did the system of totalitarianism, which you mentioned and which existed in our country for 73 years and seemed indestructible, crumble over night?

[Sagdeyev] I as a physicist always draw an analogy with my science. And in this case I can compare our society with the stability of plasma in controlled thermonuclear fusion. This is a most difficult problem. There is just one means, a very expensive one, incidentally, which can make plasma absolutely stable—this is "active action through the feedback technique." In what does it consist? All kinds of logging devices detect at an early stage the perturbation of the plasma, while the computer, which receives the signal, quickly turns on electromagnetic action at the necessary place of the plasma trap. The perturbation is suppressed, and thus stability is

achieved. It has also happened this way in our society. True, instead of plasma sensors an imposing system of political control and observation, including the KGB, was used. The slightest germ of disturbance was eliminated from the very start. When Gorbachev arrived, the force action disappeared, but since the system did not have natural stable equilibrium, our society was destabilized. And years, perhaps, even decades will pass, until the system again comes into equilibrium, true, already in a different capacity....

Changes at Various Academies Summarized

USSR Academy of Sciences

927A0052A Moscow RADIKAL in Russian
No 37, 25 Sep 91 p 1

[Article under the rubric "Academies on the March"]

[Text] The USSR Academy of Sciences, perhaps, will change its name, but will preserve the status of an all-union structure that directs basic research on the territory of the former USSR. Such a decision was made on 16 September at a meeting of the State Council after the discussion of this question with the leadership of the presidium of the USSR Academy of Sciences.

But the next day, 17 September, the presidium of the USSR Academy of Sciences made an unexpected decision. A week before, in opening the meeting of the presidium, Academician Marchuk stated: "We will stand up for the union academy to the end." The end came on the 17th. The presidium decided to restore Russian status to the Academy of Sciences.

The final decision of this issue has been submitted to the general meeting of the Academy of Sciences, which will be held with the participation of elected representatives of the institutes.

RSFSR Academy of Technical Sciences

927A0052B Moscow RADIKAL in Russian
No 37, 25 Sep 91 p 1

[Article under the rubric "Academies on the March"]

[Text] The RSFSR Academy of Technical Sciences (ATN) gives notice of the next election to vacancies of members of the academy. First of all scientists, who have submitted economically substantiated personal programs of basic and applied work on new science-intensive technologies and the conversion of technology for the agroindustrial complex, on economics, ecology, medicine, information science, and other priority national economic directions for Russia under the conditions of the transition to a market economy, are allowed to participate in the competition, which is being

conducted with the enlistment of computer rating analysis (103001 Moscow, Ulitsa Shchuseva, 4, the Academy of Technical Sciences, the Computer Rating Center) and foreign experts. Technology scientists, who have gone through computer rating competition, are elected as members of the problem councils of the academy.

And that is that. And then—think about it yourselves....

Ukrainian Academy of Technical Sciences

927A0052C Moscow RADIKAL in Russian
No 37, 25 Sep 91 p 1

[Article under the rubric "Academies on the March"]

[Text] The Academy of Technical Sciences of the Ukraine has been registered in the Ministry of Justice of the Ukraine, having taken a place in the ranks of the other numerous Ukrainian academies. The immediate initiator of its establishment is Academician of the USSR Academy of Sciences B. Paton. Among the founders are the Academy of Sciences of the Ukraine, the Union of Scientific and Engineering Societies, and the large Soviet enterprises. The main task, according to the statement of the initiators (and it is clear to everyone without a statement), is to ensure the accessibility of technologies, which are concentrated, of course, in the defense complex, to enterprises that work as if for other needs of people.

Academy of Cosmonautics

927A0052D Moscow RADIKAL in Russian
No 37, 25 Sep 91 p 1

[Article under the rubric "Academies on the March"]

[Text] The Academy of Cosmonautics imeni K.E. Tsiolkovskiy recently completed the first election of its full members and corresponding members. It unites in its ranks specialists in various fields of knowledge, which are related to space (space biology, medicine, power engineering, and so on). Corresponding Member of the USSR Academy of Sciences Arkadiy Ursul, a philosopher by profession, heads the new academy.

In the words of Doctor of Technical Sciences Ilya Varshavskiy, a member of the presidium of the Academy of Sciences, the need for such an academy arose, in particular, after the elimination of the Ministry of General Machine Building, which directed all space programs. The need arose to coordinate from a common center the basic research of the republic academies of cosmonautics, which are being established. It was decided to make Moscow, previously an all-union, such an interstate center. The academicians of the Academy of Cosmonautics see as their second goal the worldwide promotion of the achievements of domestic cosmonautics and the ideas of its founders.

Siberian Department of USSR AS

927A0052E Moscow *RADIKAL* in Russian
No 41, 17-23 Oct 91 p 1

[Article: "Siberian Ideas For Sale"—first paragraph is *RADIKAL* introduction]

[Text] On 23 October it is planned to found the Siberian Science Exchange, which will engage in the sale of intellectual property.

As Vladimir Abramenko, a member of the constituent committee, reported, it is anticipated that a number of institutes of the Siberian Department of the USSR Academy of Sciences and the Siberian Department of the USSR Academy of Medical Sciences will be among the founders of the exchange and talks are being held with the presidium of the Siberian Department of the USSR Academy of Sciences. Vladimir Abramenko refused to give a complete list of the founders. In his words, the Siberian Science Exchange, in addition to the sale of objects of intellectual property, will carry out investment activity, investing assets in various projects at the stage of their development. Highly skilled specialists who are experts of the Siberian Science Exchange, in the words of Abramenko, will perform patent work and will provide marketing, information, and consulting services. In the opinion of several local entrepreneurs, the establishment in Novosibirsk of a science exchange is natural, since there are more than 100 scientific research institutes and design institutes in the city.

Crisis in Publication of Scientific Materials Noted

927A0069A Moscow *KHIMIYA I ZHIZN* in Russian
No 6, Jun 91 pp 12-13

[Article by S. Bessonov: "The Voice of Science Has Become Quieter"—first paragraph is *KHIMIYA I ZHIZN* introduction]

[Text] The first alarm signal rang for me in the fall of last year. At one of the conferences the editor in chief of a scientific journal said that the manuscript file of the publication was empty, it would be a good idea to collect the texts of speeches and publish them. The situation, which seemed to scientific workers impossible (and even desired) about five years ago, had become a reality.

Yesterday and Tomorrow

Let us remember. Not that long ago in nearly every publication devoted to science the talk was about the inefficiency of our scientific journals. Articles expected a wait of one and a half to three years, the more respectable the journal, the longer. They joked that *IZVESTIYA AN SSSR* had turned into *ARKHIV*. Indeed, in dynamic, rapidly developing fields of science the situation can change fundamentally in a matter of months. A work, which was a priority one at the moment of completion, by the time of publication quite often was only an archive document that made it possible to assert

in retrospect: We were first. And also to enter in the reports on socialist competition a certain number of points. Even science officials, when reading in lists of works instead of a precise reference the vague indication "in print," nodded understandingly.

The articles in scientific journals have lost (not entirely, but to a significant degree) their main function—the information function. They reported the results over and over again at various kinds of scholarly meetings and published them—in pieces, not strictly, but quickly—in all kinds of theses and proceedings. This, incidentally, ruined the hand of many young people, who "urged the horses on" out of necessity: Everyone knows that serious results appear in the third year of graduate studies, but it would be necessary immediately after the entrance examinations to turn in articles in order to be in time.

At that time many people wrote: It is necessary to relieve the information log jam, it is necessary to launch new journals. Perhaps, on the same "theses" and "proceedings" paper, but professional and, what is the main thing, prompt ones.

Why, one would think, remember the past? It happened.... The average time for publication in scientific journals is a year. Is it normal?

It is not normal! The old wiring does not burn now only because there is no voltage. But if we do not consider this standstill of our science the final one, it is necessary precisely now to ponder over its new information infrastructure. In it, in spite of future computerized information networks, journals should not lose their role—as centers of the collection, standardization, examination, and dissemination of the scientific product.

Today

What are they, these repositories of the works of highly specialized intellect, which have now increased in price on the average by a ruble? The number of copies is from several hundred to several thousand. The subscribers are first of all libraries. Therefore, the decline of subscription in 1991 by 30 percent hardly means the same kind of decrease of the reading audience. Rather, it characterizes the relative impoverishment of scientific personnel, who, in spite of the wage increase, are no longer capable of paying 25-30 rubles [R] a year for the convenience of reading a journal at home.

A journal takes from six to eight months to be prepared for publication. Typographic operations take about three months. The rest is editorial preparation and correspondence with reviewers. Is it possible to speed it up? It would be. "Would" is money and equipment.

The first thing is the mail. A package with an article from Nizhneye takes nearly three weeks to arrive, a letter about Moscow sometimes takes up to two. Thus, a facsimile machine, which is accessible to the editorial office and the reviewers, would shorten the preparation cycle by more than a month.

The second thing is retyping. By accepting articles from authors on computer diskettes (of course, optionally) and editing them on the display screen, it is possible to save a lot of paper and several more weeks of time. And it is possible to send to the printing plant a finished journal that has been laid out on computer—this is a saving of another one and a half to two months.

Are these lucid dreams of a happy life? Where is one to get this very "would"? The journals of the Academy of Sciences today are unprofitable, each one yields (carries away?) a loss of several tens of thousands of rubles. For the Nauka Publishing House alone it is about R6 million a year. The poverty of editorial offices is incredible. Here is IZVESTIYA AN SSSR. SERIYA BIOLOGICHESKAYA. The royalty fund per issue is R250. R100 is spent on paying for translations of annotations into English, R100 is paid to artists for drawings. The remainder is the fee for personal notes and for reviews. Will you really rouse reviewers with such a fee?

But now let us return to "would." The journal is translated and is sold abroad in several hundred copies. The price of a one-year subscription is \$725. This means that just one subscriber in a year pays more than a facsimile machine costs. Twenty one-year subscriptions pay for a desktop computer system for the makeup and layout of the journal. They know nothing about this currency either at the editorial office or at the publishing house. They refer to the All-Union Copyright Agency and "Mezhdunarodnaya kniga." But the journal is among the unprofitable ones, it supposedly gobbled up from the state last year R20,540. These are tricks of inconvertible accounting, the prestige of Soviet scientists is still worth something on the world market. Otherwise they would leave by the thousands.

The situation with the above-described journal is typical. Does it turn out that it is sufficient to take a little

currency from the monopolists and journals will revive? No. But they will be ready for the time when science revives.

People

Authors are the strong point of journals. Authors are leaving in order to work in a normal everyday and information environment. The brain drain is not only emigration. Authors, past and potential, are leaving for new organizational structures—to make a science-intensive product and to earn money. There they have no time for scribbling. The authors are taking care of "know-how." And they are acting correctly: There is no longer anyone in the country to take care of it. The authors are writing for foreign journals: They want people in the world to know about their works.

How is one to attract them to our journals? Suppose articles are published in a two- to three-month period. Suppose they are translated into the language you need. Suppose they pay the authors royalties (an article requires much work, why should it be free?). What else do you need, authors? What kind of journals do you need, readers?

Editorial note. KHIMIYA I ZHIZN for many years yielded a profit running in the millions and to a significant extent covered the losses from the publication of scientific journals. Without having raised the subscription price sharply under the pressure of paper makers, printers, and distributors, we ourselves are now barely making ends meet. And still we are not indifferent to the fate of our partners, who are more scientific, but less protected by the attention of readers. We propose to discuss the idea of a special fund for the support of scientific journals, which could exist on a charitable or some other basis and could promote the publication of the scientific product.

COPYRIGHT: Izdatelstvo "Nauka" "Khimiya i zhizn" 1991

END OF

FICHE

DATE FILMED

5, May 1992